

**JERROLD**

a GENERAL INSTRUMENT company

COMMANDER III CATV HEAD-END SYSTEM**INTRODUCTION**

Jerrold Commander III Head-End System equipment is the realization of an integrated CATV head-end design which saves space, time, and initial investment as well as future outlays when expansion becomes necessary.

The concept of interchangeable modules, and modules common to both TV signal processing and video modulating configurations within the same main frame, greatly facilitates planning, installing, operating, and maintaining a head-end with the utmost economy.

Integrated circuitry provides high reliability in performance of frequency and temperature-sensitive networks. A built-in group delay equalizer tightly controls envelope delay from edge to edge of the video information passband. This ensures minimum chroma delay and optimum transient performance, resulting in sharp and crisp pictures. This feature becomes all the more important where multiple processing (Hub) systems covering widely separated distribution areas have to ensure satisfactory viewing by subscribers at all the extremities of the system.

In addition, an optional type of the Commander III equipment, Model CHPPD and CMMP, can be ordered factory-equipped with phase-locked output conversion modules and/or with automatic signal replacer and automatic IF switching modules (for program control), or these modules can be installed in the field at a later date when system expansion requires it.

All these facilities permit designing a head-end which will suit any individual system requirements and configurations for up to 35 channels and in strict compliance with FCC standards and regulations.

The equipment is designed for 19" standard rack or cabinet mounting, requiring a mere 3-1/2 inches of vertical rack space per unit. The necessary mounting hardware as well as essential intercables and an extremely well-matched adapter for the 75 Ω test terminals are shipped with each Commander III unit.

Before installation and operational set-up is attempted, the user should acquaint himself with the information presented in the following tables:

Table 1.... Modular Composition of Commander III Equipment

Table 2.... Specifications for the Commander III Processor

Table 3.... Specifications for the Commander III Modulator

Tables 4, 5, 6... Antenna Signal Level Considerations

Table 7.... Control and Connector Functions of Processor

Table 8.... Control, Connector, and Metering Functions of Modulator.

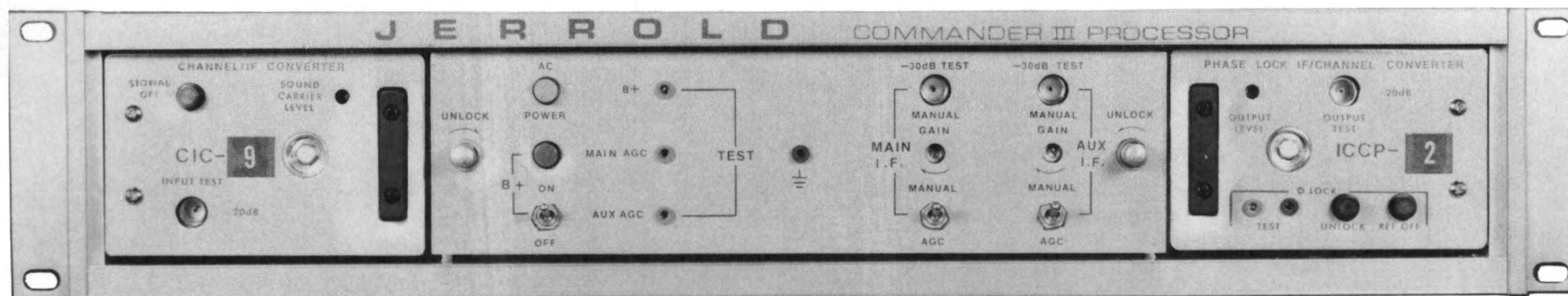


Fig. 1 PROCESSOR EQUIPPED FOR VHF OFF-CHANNEL AND PHASELOCK OPERATION

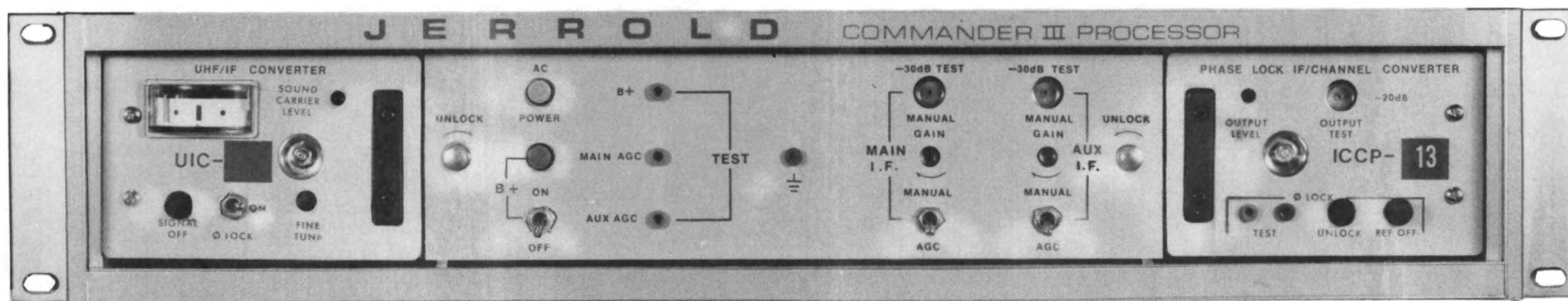


Fig. 2 PROCESSOR EQUIPPED FOR UHF OFF-CHANNEL AND PHASELOCK OPERATION

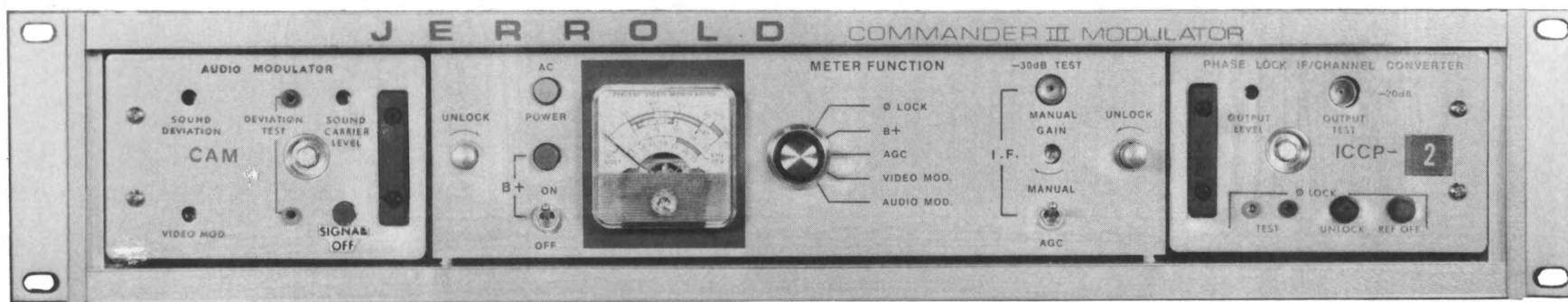


Fig. 3 MODULATOR EQUIPPED FOR PHASELOCK OPERATION

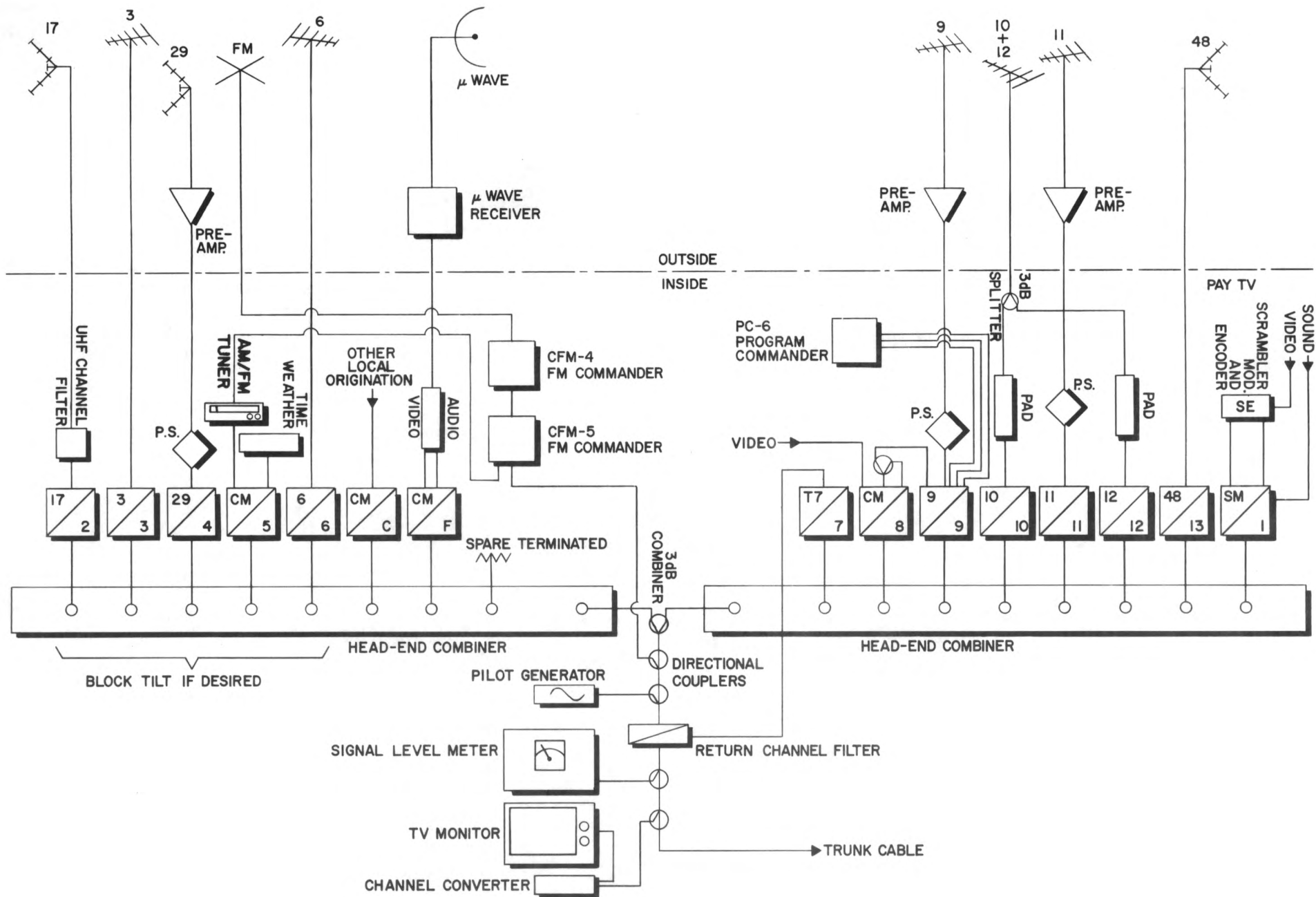


Fig. 4 TYPICAL HEAD-END CONFIGURATION

TABLE 1 MODULAR COMPOSITION OF COMMANDER III EQUIPMENT

| Module Designation | Description | Processors | | Modulators | |
|--------------------|----------------------------------------|------------|-------|------------|------|
| | | CHPD | CHPPD | CMM | CMMP |
| PMF | Processor Main Frame | X | X | — | — |
| MMF | Modulator Main Frame | — | — | X | X |
| CPR | Power Supply Module | X | X | X | X |
| IFF | IF Filter | X | X | — | — |
| CIC or UIC | Channel (VHF or UHF) to IF Converter | X | X | — | — |
| CIA | IF Amplifier and AGC Module | X | X | — | — |
| CAX | Auxiliary AGC Module | X | X | X | X |
| ICC | IF-to-Channel Converter | X | — | X | — |
| ICCP | IF-to-Channel Converter with Phaselock | — | X | — | X |
| CVM | Video Modulator | — | — | X | X |
| CAM | Audio Modulator | — | — | X | X |
| CVF | Vestigial Sideband Filter | — | — | X | X |
| PLB | Phaselock Module | — | X | — | X |
| CDL | Delay Equalizer Module | X | X | — | — |
| CSR (option) | Signal Replacer Module | X | X | X | X |
| CIS (option) | IF Switching Module | X | X | X | X |

TABLE 2 SPECIFICATIONS—COMMANDER III PROCESSOR, MODEL CHPD

| | |
|--------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|
| Input Channels | T7 thru T11, 2 thru 13, A thru W, and 14 thru 83. |
| Output Channels | T7 thru T11, 2 thru 13 and A thru W. |
| RF Input and Output Terminal Impedance | 75 ohms. |
| RF Input and Output Terminal Match | 16 dB minimum return loss. |
| Input Level Range, any channel | —20 to +30 dBmV. |
| Output Level Range, any channel | 10 dB, continuously adjustable from 50 to 60 dBmV. |
| Frequency Tolerance (total conversion tolerance) | ±14 kHz, from 32° to 120°F. |
| Noise Figure, at full gain | 5 dB or better for sub and lo-band channels, 6 dB or better for mid, high and super band channels, 9 dB or better for UHF channels. |
| Carrier-to-Noise Ratio at +10 dBmV in | 60 dB or better at VHF, 57 dB or better at UHF. |
| Sound Limiting | 10 dB or better at —25 dBmV in. |
| Sound Carrier Level, adjustable | —5 to —25 dB relative to video output carrier. |
| IF Video Carrier | 45.75 MHz. |
| IF Sound Carrier | 41.25 MHz. |
| AGC Accuracy | ±0.5 dB maximum at +60 dBmV out, for input changes from —20 to +30 dBmV. |
| AGC Response Speed for 6-dB step input change | 5 ms attack and release. |
| Response Flatness | +0.5 to —1.0dB from —0.75 to +4.18 MHz relative to video carrier. |
| Adjacent Channel Rejection | 60 dB or better. |
| Intermodulation (Overload) at input | —80 dB or better for adjacent channels, each at 10 dBmV. |
| Cross-Modulation at input | —80 dB or better with any number of other channels, each at +10 dBmV. —70 dB or better with any number of other channels, each at +20 dBmV. |
| Image Rejection | 60 dB or better. |
| Spurious Output | —70 dB or better at 60 dBmV out, 5 to 350 MHz. |
| Recommended Output Level | +60 dBmV maximum. |
| IF Output Level | +30 dBmV. |
| IF Input Level Range | +23 to +37 dBmV, for ±0.5 dB RF output change. |
| Group Delay | ±25 ns video thru color subcarrier +75 to —25 ns, from video carrier to —0.75 MHz. |

TABLE 3 SPECIFICATIONS—COMMANDER III MODULATOR, MODEL CMM

| | |
|------------------------------------------|---------------------------------------------------------------------------------------------|
| Output Channels | T7 thru T11, 2 thru 13, and A thru W. |
| RF Output Terminal Impedance | 75 ohms. |
| RF Output Terminal Match | 16 dB minimum return loss. |
| Recommended Output Level | +60 dBmV, maximum. |
| Output Level Range | 10 dB, continuously adjustable from 50 to 60 dBmV. |
| Spurious Output | −70 dB or better at 60 dBmV out, 5-350 MHz. |
| Frequency Tolerance | ±14 kHz, from 32° to 120°F. |
| Sound Carrier Level | adjustable from −5 to −25 dB, relative to video output carrier level. |
| IF Video Carrier | 45.75 MHz. |
| IF Sound Carrier | 41.25 MHz. |
| IF Output Level | +30 dBmV. |
| IF Input Level Range | +23 to +37 dBmV, for ±0.5 dB RF output change. |
| Overall Group Delay | conforms to FCC requirements for color broadcast, Pt./para. 73.687. |
| Video Input Level | 0.5 V p-p minimum for 87.5% modulation. |
| Video Input Type | composite, NTSC standard, negative sync. |
| Video Input Impedance | 75 ohms. |
| Video Input Match | 30 dB min. return loss, 25 Hz to 6 MHz. |
| Overall Amplitude Response | ±1 dB or better, 25 Hz to 4.18 MHz. |
| Differential Gain | 0.5 dB max., for 87.5% depth of modulation, 10% to 90% average picture level. |
| Differential Phase | 1° max. for 87.5% depth of modulation, 10% to 90% average picture level. |
| AM Hum and Noise | −60 dB or better, relative to 87.5% depth of modulation. |
| Sync Compression | 0.4 dB max., for 87.5% depth of modulation. |
| Tilt or Sag of 60 Hz Square Wave | 1% maximum. |
| Modulation Range | to 95%. |
| White Level Limit | adjustable from 80% to 95% depth of modulation. |
| Audio Input Type | 600 ohms balanced; Cannon jack type XLR. |
| Audio Input Level | continuously adjustable, 50 mV rms (−24 dBm) min. for ±25 kHz deviation, at 1 kHz or lower. |
| Audio Frequency Response | ±1 dB or better, 50 Hz to 15 kHz, including standard pre-emphasis. |
| Harmonic Distortion | 1% max., at ±25 kHz deviation, 50 Hz to 15 kHz. |
| FM Hum and Noise | −60 dB or better, relative to ±25 kHz deviation. |
| Inter-Carrier Frequency | 4.5 MHz ±1 kHz. |
| Aural Subcarrier Frequency | 4.5 MHz. |
| Aural Subcarrier Input Impedance | 75 ohms, unbalanced. |
| Aural Subcarrier Input Match | 15 dB minimum return loss. |
| Aural Subcarrier Input Level Requirement | 3.16 mV rms (10 dBmV) minimum. |
| Metering: 1. Video Modulation | indicates peak percent depth of modulation, within ±3%, for any composite video waveform. |
| 2. Audio Modulation | indicates deviation in kHz, within ±5% up to 35 kHz deviation. |
| 3. AGC Voltage | indicates operating point in DC volts within ±3%, of AUX IF AGC system. |
| 4. B+ | indicates regulated supply DC voltage, ±3% max. |
| 5. ∅ Lock | indicates output phaselock correction DC voltage, ±3%. |

TABLE 3a GENERAL SPECIFICATIONS COMMON TO MODELS CHPD AND CMM

| | |
|------------------------------------|-------------------------------------------------------|
| Operating Temperature Range | 32° to 120°F. |
| AC Power Requirements | 100 to 130 volts, 50 or 60 Hz, 25 watts. |
| Internal, Regulated Supply Voltage | 20 V DC. |
| DC Standby Power Requirements | 23 to 30 V, 900 mA maximum. |
| Mounting | 19-inch standard relay rack or cabinet. |
| Overall Dimensions | 19-inch front panel, 3.5 inches high, 17 inches deep. |
| Shipping Weight | 21 lbs. |

TABLE 3b SPECIFICATIONS FOR PHASELOCK PARAMETERS IN MODELS CHPPD AND CMMF

| | |
|------------------------|---------------------------------------------------------------|
| Phaselock Capabilities | a. single channel, b. incremental, or c. harmonic |
| Reference Signal Level | +10 to +30 dBmV (CW); +20 to +30 dBmV (modulated carrier). |
| Capture Range | ±40 kHz. |

TABLE 3c SPECIFICATIONS—SIGNAL REPLACER MODULE CSR (OPTIONAL)

| | |
|-----------------------------------------------------------------|--------------------------------------------------|
| Standby Carrier Modes (relevant to -15 dB sound carrier) | a. CW, |
| | b. external video -1 V p-p for 87.5% modulation. |
| Carrier Output Level | c. external 4.5 MHz sound, at 150 mV rms min. |
| Carrier Delay (Turn-On) | 0 to -10 dB relative to normal video level. |
| | 0, or 5, or 25 seconds—switchable. |

INPUT SIGNAL REQUIREMENTS FOR PROCESSORS

- For the proper operation of the Commander III Processor it is assumed the associated antenna has been designed for :
 - highest gain, by stacking and - if needed - by using a preamplifier, where the off-air signal is weak;
 - optimum phasing and spacing, to minimize the effect of interfering signals.
- The Processor recommended input signal level is +10 dBmV. This level will yield a C/N (carrier-to-noise) ratio of 60 dB minimum for VHF channels and 57 dB minimum for UHF channels, with the video carrier centered near the mid-range of the AGC capability of the Processor. This establishes a margin of 20 dB for up-swings and 30 dB for down-swings (fading) of the input signal level; see specifications Table 2. Higher input levels will reduce the margin for up-swings with very little improvement in the C/N ratio, while lower input levels will reduce the C/N ratio.
- To prevent especially the latter condition, it is important to have a record of the signal level swings over a reasonable period at the antenna output terminals, and to know the attenuation the particular channel will suffer in the antenna coaxial download. A simple calculation will determine whether or not a single-channel, mast-mounted preamplifier should be used. It must be remembered that the signal-to-noise ratio at the antenna terminals will be degraded by the noise figure of electronic devices in the rest of the system.
- In no case should the input signal level to the Processor be allowed to fall below -20 dBmV or to rise above +30 dBmV. If the combination of antenna gain, preamplifier gain, and cable loss exceeds the desired input level of +10 dBmV, an optional in-line pad of the PDA-* series should be used at the Processor RF input terminal.
- The Processor is designed for handling any number of interfering signals at levels as high as that of the desired signal, without the use of an external filter for the channel to be processed or traps for interfering adjacent channels. However, where such interfering signals are present at levels higher than that of the desired signal, the use of optional bandpass filter Models PBF-* , and of trap Models TLB, THB, or TFM, makes possible to keep the interfering signal levels below that of the desired one under worst fading conditions.
- There may be some geographical areas where long-term, pronounced up-swings from normal signal levels may occur. In such cases it may be advisable to operate the Processor at a somewhat lower input level and accept a slight trade-off in the optimum C/N ratio while the AGC circuitry will still properly handle the signal level variations.
- To enable the head-end designer to quickly relate antenna signal level conditions to the requirements of properly driving the Commander III Processor, three tables are given here; the tables are self-explanatory.

TABLE 4 TYPICAL LEVEL SWINGS AS A FUNCTION OF ANTENNA SIGNAL LEVELS

| Average Antenna Signal Level | Typical Level Swings | Min. / Max. |
|------------------------------|----------------------|--------------------|
| -15 dBmV | ±15 dB | -30 dBmV/ 0 dBmV |
| - 5 dBmV | ±10 dB | -15 dBmV/ + 5 dBmV |
| + 5 dBmV | ± 5 dB | 0 dBmV/ +10 dBmV |
| +10 dBmV | ± 2 dB | + 8 dBmV/ +12 dBmV |
| above +10 dBmV | negligible | |

TABLE 5 DETERMINATION OF REQUIREMENT FOR A VHF PREAMPLIFIER WITH A TYPICAL GAIN OF 20 dB AND A TYPICAL NOISE FIGURE OF 5 dB

| Antenna Signal dBmV | Preamplifier C/N Ratio dB | Preamplifier Output dBmV | Average Download Loss, dB* | Comdr. III Input Level dBmV | Comdr. III C/N Ratio dB | Head-End C/N Ratio dB | Commander III without Preamplifier Input, dBmV C/N, dB | | Comment |
|---------------------------|---------------------------|--------------------------|----------------------------|-----------------------------|-------------------------|-----------------------|--------------------------------------------------------|----------------|-------------------------------------|
| -20 | 34 | 0 | 4.5 | - 4.5 | 50 | 34 | -24.5 | — | Needs Preamplifier with 20+ dB gain |
| -30 } -15 } ±15 0 } | 24 39 54 | -10 + 5 +20 | 4.5 4.5 4.5 } 400' | -14.5 + 0.5 +15.5 | 40.5 55 66 | 24 39 53.5 | -34.5 -19.5 - 4.5 | — | Preamplifier Needed |
| -15 } - 5 } ±10 0 } | 39 49 59 | + 5 +15 +25 | 3.5 3.5 3.5 } 300' | 0** +10** +20** | 54.5 63.5 68 | 39 49 58.5 | -18.5 - 8.5 - 3.5 | 36 46 51 | Preamplifier Needed |
| 0 } + 5 } ±5 +10 } | 54 59 64 | +20 +25 +30 | 2.5 2.5 2.5 } 200' | + 5** +10** +15** | 59 63.5 66 | 52.5 57.5 62 | - 2.5 + 2.5 + 7.5 | 52 57 61 | Preamplifier Optional |
| +10 | 64 | +30 | 1.0 } 100' | +10** | 63.5 | 61 | + 9 | 62 | No Preamplifier |
| +20 | 74 | +40 | 1.0 } | +10** | 63.5 | 63 | +10** | 63.5 | No Preamplifier |

Notes: *The average download losses are based on the use of polystyrene dielectric type, aluminum-sheathed, coaxial cable with an outer sheath diameter of 0.5 inches, and measured for 100 feet of such cable at channel 13.

**Levels are padded down to the desired +10 dBmV input.

TABLE 6 DETERMINATION OF REQUIREMENT FOR A UHF PREAMPLIFIER WITH A TYPICAL GAIN OF 22 dB AND A TYPICAL NOISE FIGURE OF 6 dB

| Antenna Signal dBmV | Preamplifier C/N Ratio dB | Preamplifier Output dBmV | Average Download Loss, dB* | Comdr. III Input Level dBmV | Comdr. III C/N Ratio dB | Head-End C/N Ratio dB | Commander III without Preamplifier Input, dBmV C/N, dB | | Comment |
|-----------------------------|---------------------------|--------------------------|----------------------------|-----------------------------|-------------------------|-----------------------|--------------------------------------------------------|----------------|-------------------------------------|
| -20 | 33 | + 2 | 8 | - 6 | 45 | 33 | -28 | — | Needs Preamplifier with 22+ dB gain |
| -30 } -15 } ±15 0 } | 23 38 53 | - 8 + 7 +22 | 8 8 8 } 400' | -16 - 1 +14 | 35 50 60.5 | 23 38 52 | -38 -23 - 8 | — | Preamplifier Needed |
| -15 } - 5 } ±10 + 5 } | 38 48 58 | + 7 +17 +27 | 6 6 6 } 300' | + 1 +11 +21 | 52 59 64 | 38 47.5 57 | -21 -11 - 1 | 30 40 50 | Preamplifier Needed |
| 0 } + 5 } ±5 +10 } | 53 58 63 | +22 +27 +32 | 4 4 4 } 200' | + 5** +10** +15** | 55 59 61 | 51 55.5 59 | - 4 + 1 + 6 | 47 52 56 | Preamplifier Optional |
| +10 | 63 | +32 | 2 } 100' | +10** | 59 | 57.5 | + 8 | 57.5 | No Preamplifier |
| +20 | 73 | +42 | 2 } | +10** | 59 | 59 | +10** | 59 | No Preamplifier |

Notes: *The average download losses are based on the use of polystyrene dielectric type, aluminum-sheathed, coaxial cable with an outer sheath diameter of 0.5 inches, and measured for 100 feet of such cable at 890 MHz.

**Levels are padded down to the desired +10 dBmV input.

TABLE 7 CONTROL AND CONNECTOR FUNCTIONS OF COMMANDER III PROCESSOR









| Module | Designation | Description and Schematic Reference | Position | Function |
|--------------------------------|-----------------------------|------------------------------------------|------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| CIC-* Front Panel | Signal Off | Light-Emitting Diode, CR551 | lit | Indicates absence of signal at converter input. |
| | Input Test, -20 dB | Test Jack, TP501 | — | Permits connection of signal level meter for measuring input signal level. |
| | Sound Carrier Level | Potentiometer, R575 |  max. | Permits adjustment of sound carrier output level. |
| Inside, Right Rear | Local Oscillator | Slide Switch, S551, factory-set | Ext. | On-Channel operating position. |
| | | | Int. | Off-Channel operating position. |
| UIC-* | Signal Off | Light-Emitting Diode, CR775 | lit | Indicates absence of signal at converter input. |
| | (Meter) | Phaselock Meter, M775 | — | Indicates phaselock offset or sweeping phaselock, with the \emptyset Lock switch in the ON position. |
| | Fine Tune | Potentiometer, R708 | — | Permits adjustment of phaselock offset, with \emptyset Lock switch in ON position. |
| | \emptyset Lock | Toggle Switch, S775 | ON (off) | Activates phaselock circuit to maintain video output frequency exactly at 45.75 MHz. Deactivates phaselock circuitry. |
| | Sound Carrier Level | Potentiometer, R710 |  max. | Permits adjustment of sound carrier input level. |
| Center Drawer, Front Panel | AC Power | Pilot Lamp, L1 | lit | Indicates unit energized from AC line. |
| | B+ | Pilot Lamp, L2 | lit | Indicates B+ supply is ON with B+ switch in ON position. |
| | B+ | Toggle Switch, S2 | ON | Activates B+ supply. |
| | TEST B+ | Tip Jack, TP3 | — | Permits connection of DC voltmeter for measuring B+ voltage. |
| | Main AGC | Tip Jack, TP4 | — | Permits connection of DC voltmeter for measuring Main AGC voltage. |
| | Aux. AGC | Tip Jack, TP5 | — | Permits connection of DC voltmeter for measuring Auxiliary AGC voltage. |
| | \perp or Common | Tip Jack, TP6 | — | Ground (negative probe) connection for metering instrument. |
| | Main I.F. | -30 dB Test, TP2, 75 Ω Fitting | — | Permits connection of signal level meter through test probe PMG-61-F for measuring Main I.F. output level. |
| | | Manual Gain, Potentiometer, R1 |  max. | Permits adjustment of gain of Main I.F. amplifier, with switch S3 in Manual position. |
| | | Toggle Switch, S3 | Manual AGC | For Manual Gain control adjustment by R357. Main I.F. amplifier operates under AGC. |
| | Aux. I.F. | -30 dB Test, TP1, 75 Ω Fitting | — | Permits connection of signal level meter through test probe PMG-61-F for measuring Auxiliary I.F. output level. |
| | | Manual Gain, Potentiometer, R237 |  max. | Permits adjustment of gain of Auxiliary I.F. amplifier, with switch S1 in Manual position. |
| | | Toggle Switch, S1 | Manual AGC | For Manual Gain control adjustment by R237. Auxiliary I.F. amplifier operates under AGC. |
| Center Drawer Top Cover | Main AGC I.F. Level | Potentiometer, R357 |  max. | Permits adjustment of Main AGC I.F. level. |
| Center Drawer, Bottom Cover | Signal Replacer, I.F. Level | Potentiometer, R208 | max.  | For setting CSR module I.F. level. |
| | Aux. AGC I.F. Level | Potentiometer, R237 |  max. | For setting aux. AGC output level to ICC-* module. |
| | Signal Replacer, Modulation | Potentiometer, R205 |  max. | For setting depth of modulation on CSR module. |
| | Standby Delay | Plug, P202 (factory-set to Short) | Instant | Activates I.F. switch or CSR module, where present (as set by P201) within: 0 to 1 second nominal. |
| | | | Short | 5 seconds nominal. |
| | | | Long | 25 seconds nominal. |
| | Aux. Input | Plug, P201 | I.F. Video | External I.F. source connected. External video to CSR connected. |

TABLE 7 CONTROL AND CONNECTOR FUNCTIONS OF COMMANDER III PROCESSOR (cont.)



| Module | Designation | Description and Schematic Reference | Position | Function |
|-----------------------------------|----------------------------|-------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| ICC-* Front Panel | Output Test, -20 dB | TP401, 75 Ω Fitting | — | Permits connection of signal level meter through test probe PMG-61-F for measuring level of output channel. |
| | Output Level | Potentiometer, R401 |  max. | Permits adjustment of output channel level. |
| ICCP-* (Option) Front Panel | Output Test, -20 dB | TP401, 75 Ω Fitting | — | Same as for ICC-* module. |
| | Output Level | Potentiometer, R401 |  max. | |
| | \emptyset Lock, Test | Tip Jack, TP451 Tip Jack, TP452 | Test, red black | Permits connection of DC voltmeter for measuring \emptyset Lock voltage (red: positive). |
| | Unlock | Light-Emitting Diode, CR452 | blinking | Output not phaselocked, searching. |
| | Ref. Off | Light-Emitting Diode, CR453 | lit | Phaselock reference signal absent. |
| Processor, Rear Panel | R.F. In | 75 Ω Connector, J2 | — | R.F. input terminal. |
| | L.O. Out/Phaselock Ref. In | 75 Ω Connector, J3 | — | Local Oscillator output terminal for on-channel operation, or Phaselock Reference Signal input terminal. |
| | L.O. In | 75 Ω Connector, J4 | — | Local Oscillator input terminal for on-channel operation. |
| | I.F. Out | 75 Ω Connector, J6 | — | I.F. Amplifier output terminal. |
| | I.F. In, Normal | 75 Ω Connector, J7 | — | I.F. Amplifier input terminal. |
| | Program | 75 Ω Connector, J8 | — | I.F. Input terminal when optional CIS module is used for I.F. switching. |
| | Aux. Standby Mod. In | 75 Ω Connector, J9 | — | I.F. Input terminal when Aux. Standby Mod. is used, or for Emergency Alert input. |
| | R.F. Out | 75 Ω Connector, J10 | — | Output terminal of designated output channel, for jumpering to head-end output combiner. |
| | $\frac{1}{2}$ -Amp. Fuse | Fuse, F1 | — | For normal 115-V, 60-Hz line fuse. |
| | 2-Amp. Fuse | Fuse, F2 | — | Fuse for standby power input. |
| | (Terminal Block) | 9-Terminal Block, TB1 | 1 | Chassis ground and common for other terminals; connect to pin #2 on PC-6 when CIS is used. |
| | | | 2 | B+ connection for auxiliary use of +20 V d.c. output from regulated power supply; 50 mA or more of current available, depending upon module configuration. |
| | | | 3 | Connect to pin #2 to inhibit CSR. |
| | | | 4 | Override control, allows instant activation of CSR module or Aux. I.F. input by jumpering to ground terminal 1; deactivate by removing jumper (return of 5 to 20 V d.c. potential). |
| | | | 5 | Makes available a "Signal Off" control voltage of +17 to +20 V d.c. during normal operation, 0 to 0.3 V d.c. in standby or override mode; may be used for activating external relay or indicator, or may be connected to terminal 9 of another Processor or Modulator for external control of standby system. |
| | | | 6 | Permits application of 23 to 30 V d.c. from external standby power supply. |
| | | | 7 and 8 | Normal I.F. for connection to pin #1 and Program I.F. for connection to pin #3 of Program Commander PC-6 when optional CIS module is used. |
| | | | 9 | For external standby system control of another Processor or Modulator (see 5). |

TABLE 8 CONTROL, CONNECTOR, AND METERING FUNCTIONS OF COMMANDER III MODULATOR

| Module | Designation | Description and Schematic Reference | Position | Function |
|-----------------------------|-----------------------------|-------------------------------------|-----------------|----------------------------------------------------------------------------------------------------|
| CAM Front Panel | Sound Deviation | Potentiometer, R505 | max. | Permits adjustment of sound carrier deviation. |
| | Deviation Test | Tip Jacks, TP553, TP554 | — | Permits connection of VTVM for testing sound carrier deviation (red: positive). |
| | Sound Carrier Level | Potentiometer, R529 | max. | Permits adjustment of sound carrier level. |
| | Video Mod. | Potentiometer, R558 | max. | Permits adjustment of depth of video modulation. |
| | Signal Off | Light-Emitting Diode, CR513 | lit | Indicates absence of signal at module input. |
| Inside, Right Rear | Input, Audio, —4.5 MHz | Slide Switch, S501 | Audio | Accepts 600 Ω impedance audio input (factory-set switch position). |
| | | | 4.5 MHz | Accepts a 4.5 MHz aural carrier input. |
| Center Drawer, Front Panel | AC Power | Pilot Lamp, L1 | lit | Indicates unit energized from AC line. |
| | B+ | Pilot Lamp, L2 | lit | Indicates B+ supply is ON with B+ switch in ON position. |
| | B+ | Toggle Switch, S2 | ON | Activates B+ supply. |
| | Meter Function | Rotary Switch, S4 | Lock | Meter indicates phaselock correction voltage on Lock scale. |
| | | | B+ | Meter indicates B+ voltage on B+ scale. |
| | | | AGC | Meter indicates AGC voltage on AGC scale. |
| | | | Video Mod | Meter indicates depth of video modulation on % modulation scale. |
| | | | Audio Mod | Meter indicates sound carrier deviation on kHz Dev. scale. |
| | I.F. | 75 Ω Fitting, TP1 | —30 dB Test | Permits connection of signal level meter for measuring Aux. I.F. level. |
| | | Manual Gain, Potentiometer, R357 | max. | Permits adjustment of gain of I.F. amplifier, with switch S1 in Manual position. |
| | | Toggle Switch, S1 | Manual | For Manual Gain control adjustment by R357. |
| | | | AGC | I.F. amplifier operates under AGC. |
| Center Drawer, Top Cover | I.F. Level | Potentiometer, R330 | max. | For setting I.F. output level; not needed during operational set-up. |
| Center Drawer, Bottom Cover | Signal Replacer, I.F. Level | Potentiometer, R208 | max. | For setting CSR module I.F. level. |
| | Aux. AGC I.F. Level | Potentiometer, R237 | max. | For setting Aux. AGC output level to ICC-* module. |
| | Signal Replacer, Modulation | Potentiometer, R205 | max. | For setting depth of modulation on CSR module. |
| | Standby Delay | Plug, P202 (factory-set to Short) | Instant | Activates I.F. switch or CSR module, where present (as set by P201) within: 0 to 1 second nominal. |
| | | | Short | 5 seconds nominal. |
| | | | Long | 25 seconds nominal. |
| | Aux. Input | Plug, P201 | I.F. | External I.F. source connected. |
| | | | Video | External video to CSR connected. |
| ICC-* Front Panel | Output Test, —20 dB | 75 Ω Fitting, TP401 | — | Permits connection of signal level meter for measuring output level. |
| | | Potentiometer, R401 | max. | Permits adjustment of output channel video carrier level. |
| ICCP-* (Option) Front Panel | Output Test, —20 dB | 75 Ω Fitting, TP401 | — | } Same as for ICC-* module. |
| | Output Level | Potentiometer, R401 | max. | |
| | Lock, Test | Tip Jack, TP451 Tip Jack, TP452 | Test, red black | Permits connection of DC voltmeter for measuring Lock voltage (red: positive). |
| | Unlock | Light-Emitting Diode, CR452 | blinking | Output not phaselocked, searching. |
| | Ref. Off | Light-Emitting Diode, CR453 | lit | Phaselock reference signal absent. |

TABLE 8 CONTROL, CONNECTOR, AND METERING FUNCTIONS OF COMMANDER III MODULATOR (cont.)

| Module | Designation | Description and Schematic Reference | Position | Function |
|------------|----------------------|-------------------------------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rear Panel | Audio In | 3-Wire Jack, J1 | — | 600 Ω balanced audio input jack. |
| | Video In | 75 Ω Connector, J2 | — | Video input terminal. |
| | Phaselock Ref. In | 75 Ω Connector, J3 | — | Phaselock reference signal input terminal. |
| | 4.5 MHz In | 75 Ω Connector, J4 | — | 4.5 MHz aural carrier input terminal, with switch S501 in 4.5 MHz position. |
| | I.F. Out | 75 Ω Connector, J6 | — | I.F. Amplifier output terminal. |
| | I.F. In, Normal | 75 Ω Connector, J7 | — | I.F. Amplifier input terminal. |
| | Program | 75 Ω Connector, J8 | — | I.F. Input terminal when optional CIS module is used for I.F. switching. |
| | Aux. Standby Mod. In | 75 Ω Connector, J9 | — | I.F. Input terminal or for video input to CSR. |
| | R.F. Out | 75 Ω Connector, J10 | — | Output terminal of designated output channel, for jumpering to head-end output combiner. |
| | 1/2-Amp. Fuse | Fuse, F1 | — | For normal 115-V, 60-Hz line fuse. |
| | 2-Amp. Fuse | Fuse, F2 | — | Fuse for standby power input. |
| | (Terminal Block) | 9-Terminal Block, TB1 | 1 | Ground (chassis) and common for other screw terminals. |
| | | | 2 | B+ connection for auxiliary use of +20 V d.c. output from regulated power supply; 50 mA or more of current available, depending upon module configuration. |
| | | | 3 | Connect to pin #2 to inhibit CSR. |
| | | | 4 | Override control, allows instant activation of CSR module or Aux. I.F. input by jumpering to ground terminal 1; deactivate by removing jumper (return of 5 to 20 V d.c. potential). |
| | | | 5 | Makes available a "Signal Off" control voltage of +17 to +20 V d.c. during normal operation, 0 to 0.3 V d.c. in standby or override mode; may be used for activating external relay or indicator, or may be connected to terminal 9 of another Processor or Modulator for external control of standby system. |
| | | | 6 | Permits application of 23 to 30 V d.c. from external standby power supply. |
| | | | 7 and 8 | Normal I.F. for connection to pin #1 and Program I.F. for connection to pin #3 of Program Commander PC-6 when optional CIS module is used. |
| | | | 9 | For external standby system control of another Processor or Modulator (see 5). |

COMMANDER III PROCESSOR

INSTALLATION

1. BENCH INSTALLATION OF OPTIONAL MODULES

1.1 Installing Model CSR

- 1.1.1 Unlock the pawl fasteners on the center drawer of the Processor, pull out the drawer from the Main Frame and tilt the drawer up to the vertical position until it locks into place.
- 1.1.2 Remove the bottom cover from the drawer by removing the holding screws; the CAX module circuit board is now accessible for insertion of the CSR module. For easy insertion, first remove jack No.35 from its pins on the CAX board, then plug the CSR straight into the CAX board as illustrated in Fig. 7. Return jack No. 35 to its former position. Refer to the bottom coversilk screen and set switch plugs P201 and P202 as required by system design. Replace the cover.
- 1.1.3 To return the center drawer to the cage, first press the two spring-loaded latches together and let the drawer drop to the horizontal position; then push the drawer back into the cage and lock it.

1.2 Installing Model CIS

- 1.2.1 Model CIS comes factory-equipped with six hook-up wires and three coaxial cables with appropriate connectors as shown in Fig. 8 (module upside-down showing the two built-in mounting nuts).
- 1.2.2 To gain access to the rear compartment of the Processor cage, where the CIS is to be installed, first remove the six screws holding the top cover of the Processor, then slide the cover out toward the rear panel.
- 1.2.3 Stand the Processor on its side and install the CIS module, cover down - so that the mounting nuts of the CIS will register with the associated holes in the bottom of the Processor chassis; then secure the CIS with the two mounting screws, shipped with the CIS, from the bottom of the Processor chassis; see Fig. 9.
- 1.2.4 Set the Processor back to normal position on the bench. Remove connector J7 from its aperture " IF IN NORMAL " in the Processor rear panel and in its stead install connector J1, cable #21, from the CIS module, using the nut from J7.
- 1.2.5 Connect P1 from the CIS to J7.
- 1.2.6 Remove connector J8 from the " IF IN PROGRAM " aperture of the rear panel and in its stead install connector J2, cable #20, from the CIS module, using the nut from J8.
- 1.2.7 Solder the six hook-up wires of the CIS to the rear terminals of terminal block TB1 as follows:

| | | | |
|--------|----|-------|--------------|
| Black | to | TB1-1 | GND |
| White | to | TB1-2 | +20 VDC |
| Brown | to | TB1-3 | IF PROGRAM |
| Violet | to | TB1-7 | NORMAL IF |
| Green | to | TB1-8 | PROGRAM IF |
| Yellow | to | TB1-9 | PROGRAM STBY |

- 1.2.8 Dress the hook-up wires and coaxial cables along the existing harness and secure them with plastic fasteners such as tie wraps; then replace the cover on the chassis.

2. MOUNTING

- 2.1 Commander III Processors can be mounted on racks or in cabinets. For optimum air circulation it is recommended that the units be mounted in groups of three, with the groups separated by output combiners such as Jerrold Model HC-*, or by blank panels of at least 3-1/2 inches in height. Each Processor should be mounted with the four screws supplied in the accessory package, to ensure a sturdy mount.

3. INPUT CONNECTIONS (assuming filters, traps, etc. are installed where needed).

- 3.1 The Processor requires a 75 ohm coaxial input at the RF IN terminal, preferably double shielded cable such as RG-6A/U equipped with an appropriate connector such as Model F-56. It is advisable to attach a label to the input cable, identifying the input channel.
- 3.2 Before attaching the cable to the RF IN terminal, connect it to a signal level meter, then measure and record the level for future reference. Next, detach the cable from the meter and attach it to the RF IN terminal on the Processor rear panel. Should the measured level exceed the specified maximum of +30 dBmV, first install an in-line pad Model PDA of the required rating and equipped with an F-71A adapter or a short coaxial jumper at the RF IN terminal and then attach the input cable to the PDA; see Fig. 11 .
- 3.3 Should the input level be less than the specified minimum of -20dBmV, a pre - amplifier will be required for this particular weak channel; see Tables 4, 5, 6.
- 3.4 Where a Processor is equipped with a Model CSR which is to be modulated, connect the standby video signal or a 4.5 MHz aural signal to the AUX STBY MOD IN terminal and, where required, the override control lead to terminal #4 on TB1.
- 3.5 Where a PC-6 is used without a CIS module in the Processor, connect the " event output " leads from the PC-6 as follows:
 pin # 2 of PC-6 to terminal #1 of TB1 on the Processor, and
 pin # 3 of PC-6 to terminal #4 of TB1 on the Processor.

Where a CIS module is used in the Processor, connect the " event output " leads from the PC-6 as follows:

- pin # 1 of PC-6 to terminal #7 of TB1 on the Processor,
- pin # 2 of PC-6 to terminal #1 of TB1 on the Processor, and
- pin # 3 of PC-6 to terminal #8 of TB1 on the Processor.

Connect the alternate IF input to the IF IN PROGRAM terminal on the Processor, see Fig. 10.

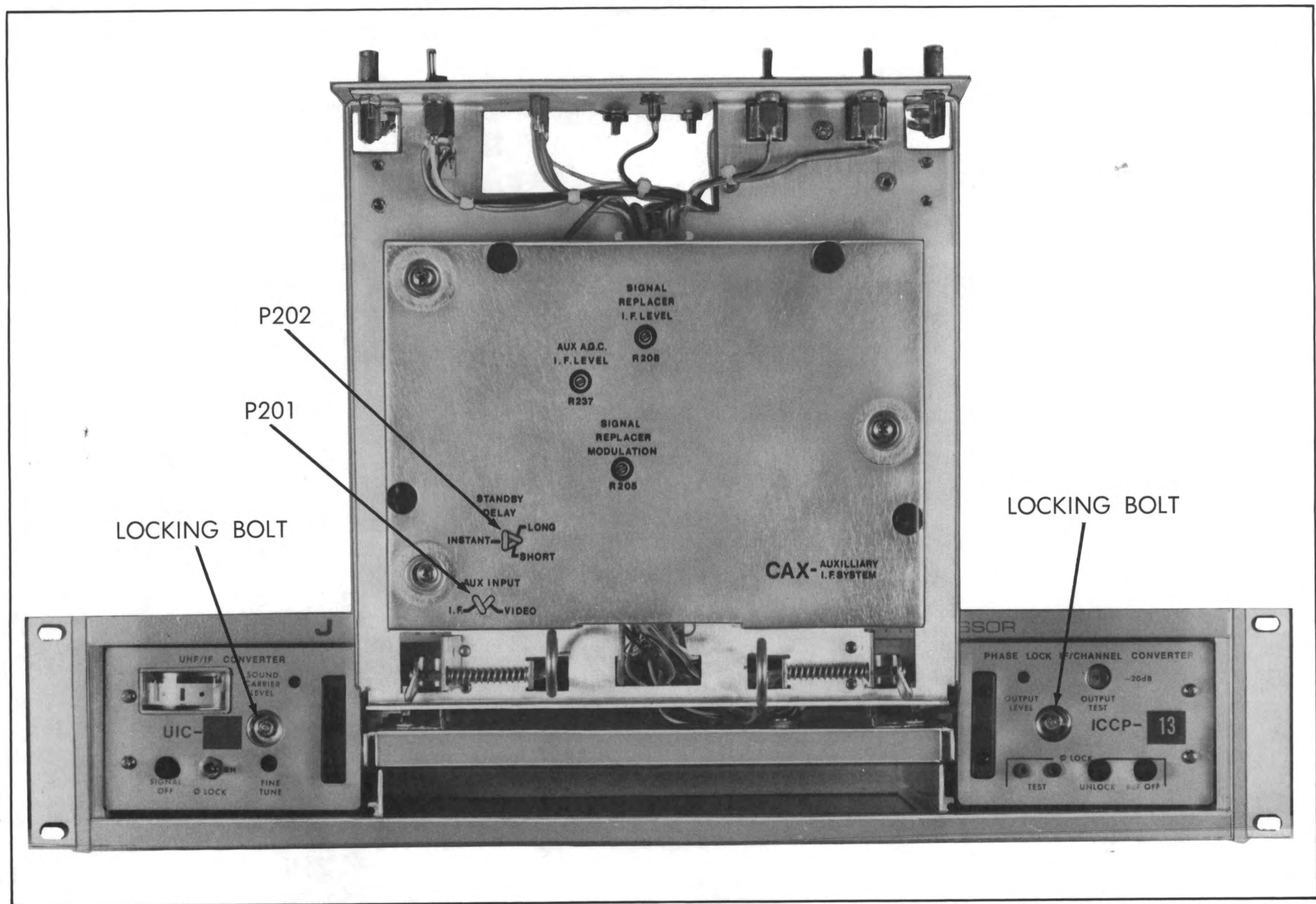


Fig. 5 PROCESSOR WITH PULLED AND FLIPPED-UP CENTER DRAWER

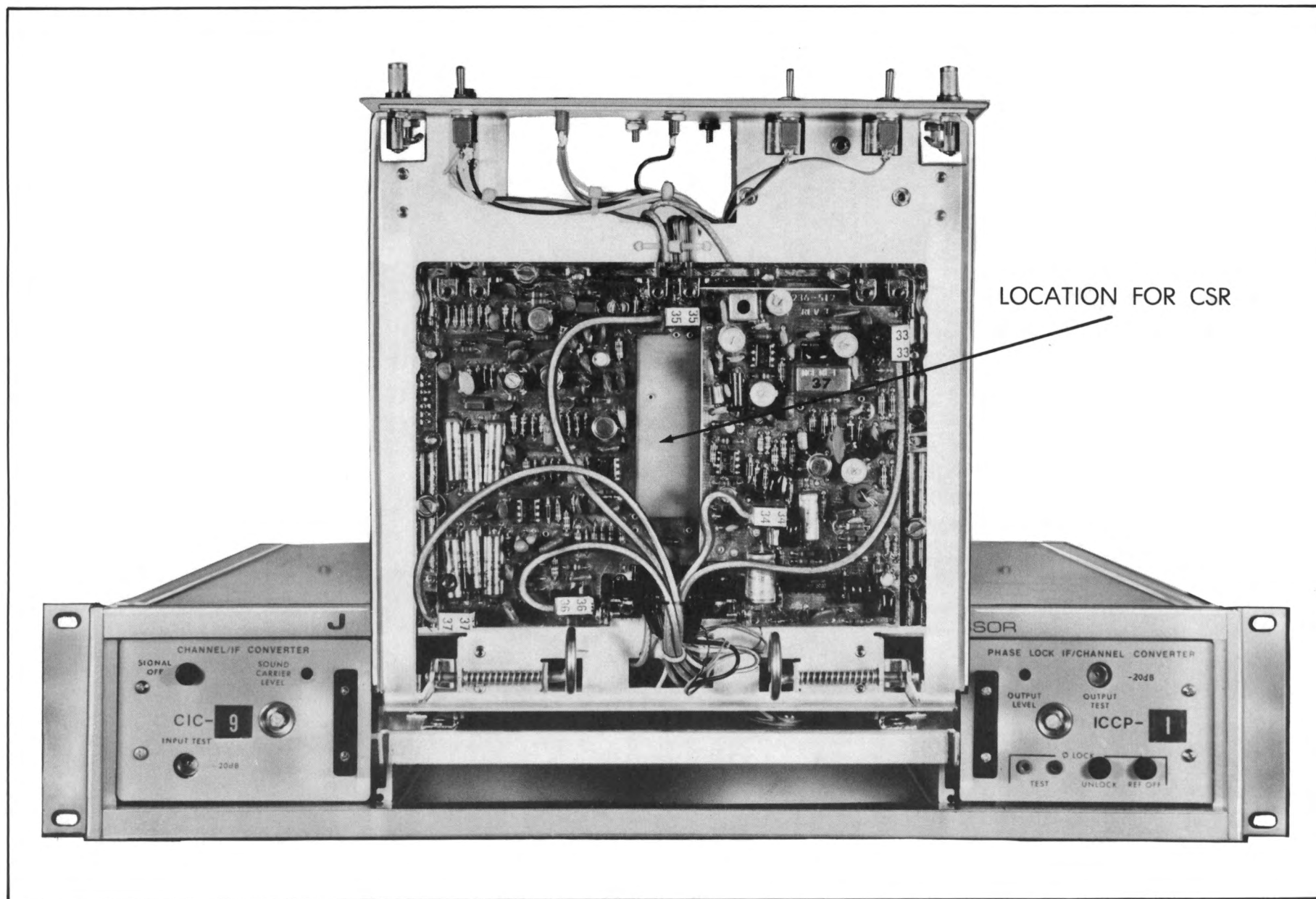


Fig. 6 PROCESSOR WITH BOTTOM COVER REMOVED FROM CENTER DRAWER

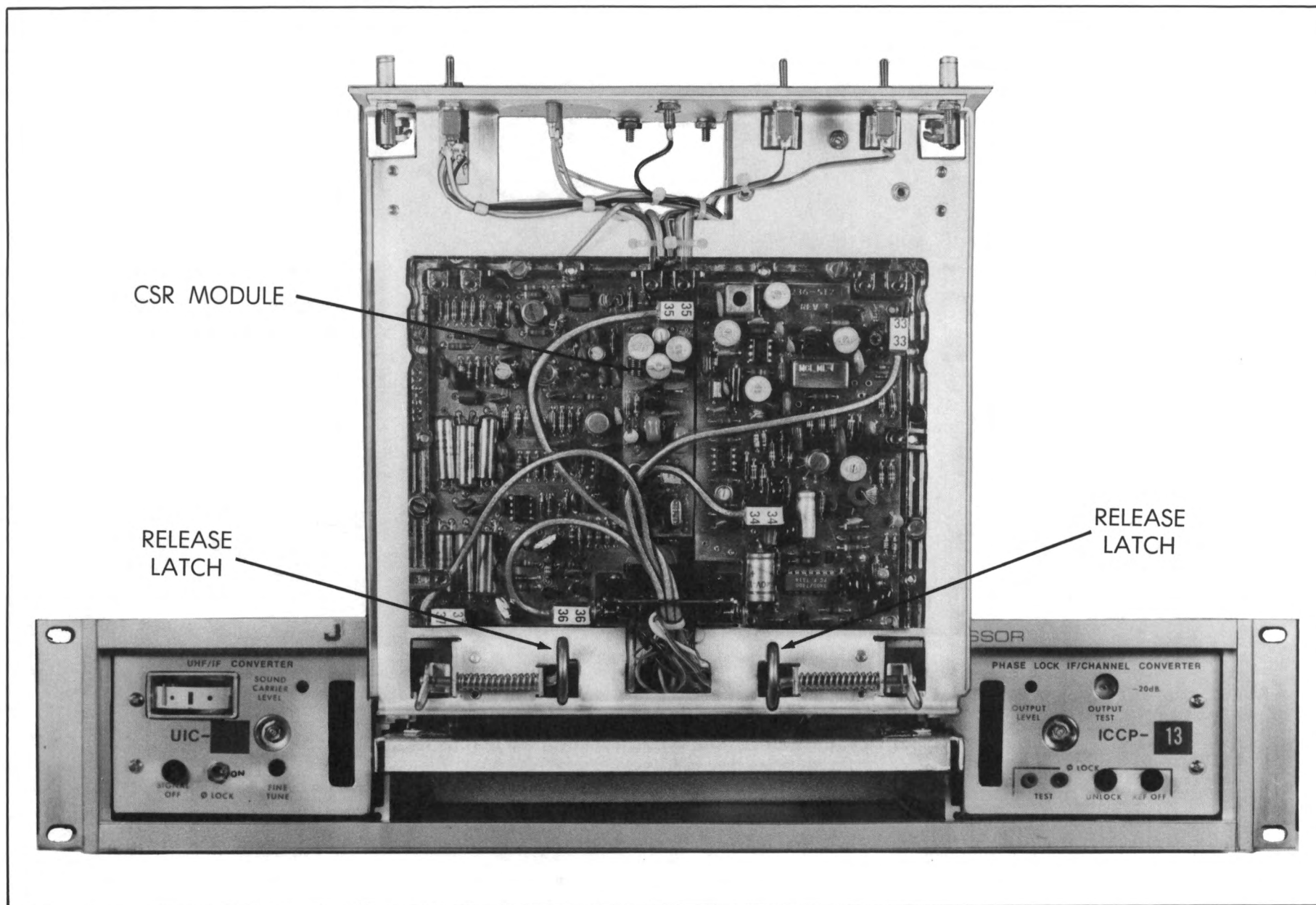


Fig. 7 PROCESSOR WITH CSR MODULE INSTALLED

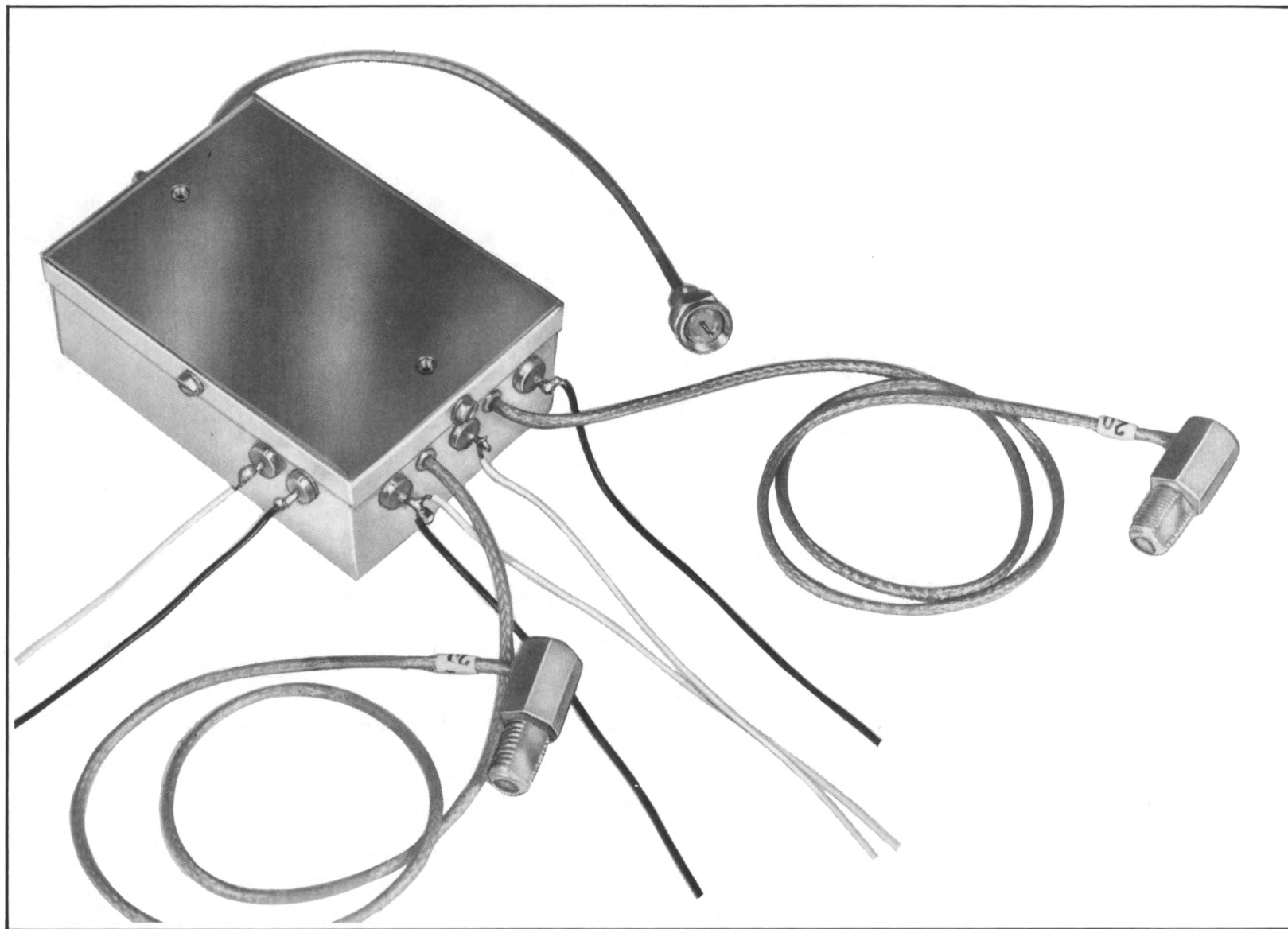


Fig. 8 CIS MODULE

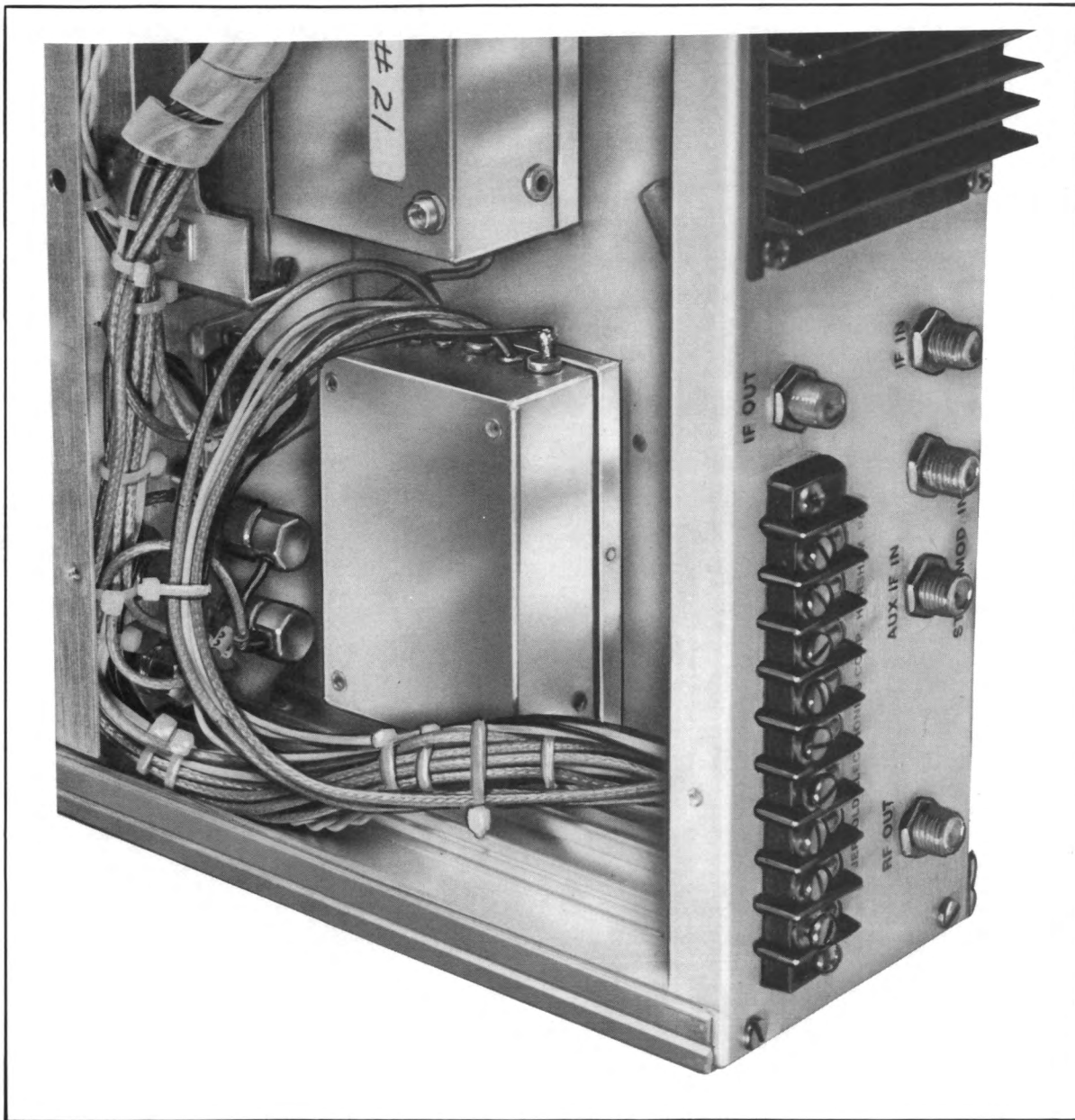


Fig. 9 CIS MODULE INSTALLED

4. INTERCONNECTIONS

- 4.1 Processors are factory-equipped for " on-channel " or " off-channel " operation as ordered by the user. However, a check should be made on the proper setting of the LOCAL OSC. switch located at the right rear top inside the CIC -* module.
- 4.2 Remove the module from the Processor main frame, using a 1/4" nut driver on the locking bolt (see Fig. 5) and pulling the module straight out. The switch is to be set to EXT for on-channel operation, or to INT for off-channel operation. Then return the module to the operating position and lock it to the main frame.
- 4.3 Connect the RF OUT terminal through a coaxial jumper of sufficient length to the head-end combiner.
- 4.4 Two coaxial jumpers are supplied with each Processor. Use one jumper for inter-connecting the L.O. IN and L.O. OUT terminals on the Processor rear panel when on-channel operation is called for. The second jumper is only needed when the IF signal is not used for programming; in that case the second jumper should be connected between the IF OUT and IF IN NORMAL terminals on the rear panel of the Processor.

5. OFF-AIR PHASE LOCK OPERATION CONNECTIONS

- 5.1 Make sure the LOCAL OSC switch on the CIC-* module is in the INT (off-channel) position. Note that UIC-* modules have no such switch.
- 5.2 Connect the RF OUT terminal as in step 4.3 above.
- 5.3 Connect the cable carrying the off-air channel reference signal to a signal level meter and measure and record the signal level for future reference. The level should be +20 to +40 dBmV; if it is higher, an appropriate in-line pad should be installed, as described in the foregoing paragraph 3.2 and Fig. 11, at the PHASELOCK REF.IN terminal on the Processor rear panel. If the signal level is too low, a single-channel preamplifier is required. Then connect the input cable to the PHASELOCK REF.IN terminal or to the in-line pad, as needed.
- 5.4 Use one or both the coaxial jumpers from the accessory package as described in paragraph 4.4 above.

OPERATION

1. TURN-ON

- 1.1 Plug the line cord of the Processor into the associated AC outlet; the AC POWER pilot lamp on the front panel should light up. Then flip the B+ front panel switch to the ON position; the B+ pilot lamp on the front panel should light up.
- 1.2 Flip the MAIN I.F. and AUX. I.F. switches on the front panel to their AGC positions; if the Processor is equipped for phaselock operation, the UNLOCK and REF OFF lights on the ICCP module should go dark, even after initial blinking. Where the unit is equipped with a UIC-* module, flip the \emptyset LOCK switch to the OFF position and note the position of the indicator on the phaselock meter scale; then switch to the \emptyset LOCK

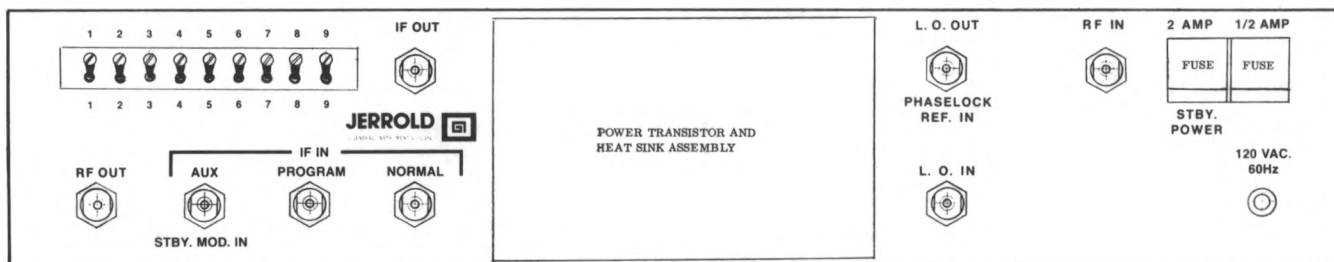


Fig. 10 PROCESSOR REAR PANEL

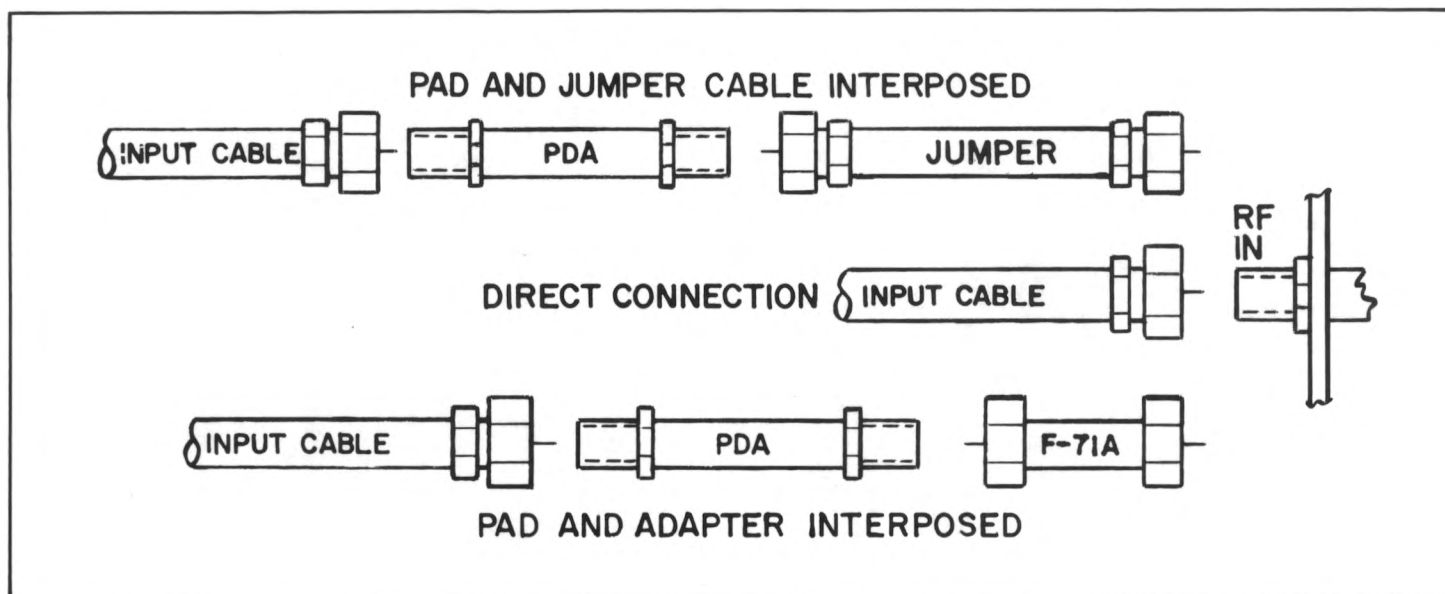


Fig. 11 RF INPUT LEVEL PADDING METHODS

ON position and, if needed, adjust the FINE TUNE control on the UIC-* front panel to place the meter indicator in the same position as noted before.

NOTE: A Model PMG-61F push-in adapter for use as an interface between signal level meter test cables and the coaxial test terminals on the Commander III front panel is factory-supplied with each unit.

- 1.3 Connect a signal level meter, tuned to the appropriate video carrier, to the INPUT TEST terminal on the CIC front panel and record the signal level, taking into account the 20 dB attenuation at that terminal. Repeat the procedure with the sound carrier; then disconnect the meter.
- 1.4 The MAIN I. F. and AUX. I. F. gain controls in the MANUAL mode do not need adjustment for initial set-up! They may be used for trouble shooting or in an emergency for manual gain mode operation of the unit.

2. OUTPUT LEVEL SETTING

- 2.1 Connect the signal level meter to the OUTPUT TEST -20 dB terminal on the front panel of the ICC (or ICCP) module. Tune the meter to the video carrier of the appropriate output channel and, if needed, adjust the OUTPUT LEVEL control as required by system design. Record the output level for future reference. Repeat this procedure for the sound carrier of the channel and, if needed, adjust the SOUND CARRIER LEVEL control to obtain a level of 15 dB below the video carrier level. Then disconnect the meter.

3. DEPTH OF VIDEO MODULATION SETTING ON CSR MODULE.

- 3.1 If the Processor has been equipped with a signal replacer module and has a standby video input, it may be necessary to adjust the depth of video modulation of the replacement signal. The best method would be to use a frequency spectrum analyzer, but since such equipment may not be available, the next best method is to use a signal level meter, an oscilloscope, and a variable attenuator. Alternatively, a directly connected TV receiver can be employed; however, this method is not accurate and is subject to the experience one has in the correct interpretation of the characteristics of television pictures.
- 3.2 The CSR module is activated either by the absence of an RF signal at the Processor input or by an override connection. The activation time is controlled by the setting of P202 on the CAX module in the case of signal absence; this condition is indicated by the SIGNAL OFF pilot lamp on CIC (or UIC) module front panel coming on.
- 3.3 Pull out the center drawer and lock it in vertical position. Then connect a signal level meter, tuned to the IF video carrier, to the AUX I. F. -30 dB test terminal on the drawer front panel and adjust the SIGNAL REPLACER I. F. LEVEL control on the drawer bottom cover for a reading of 0 dB or less as required. Disconnect the meter.
- 3.4 Depth of Modulation Setting with an Oscilloscope and Signal Level Meter.
 - 3.4.1 Disconnect the RF OUT jumper cable from the head-end combiner (or replace the jumper by another of suitable length) and connect it instead to a variable attenuator;

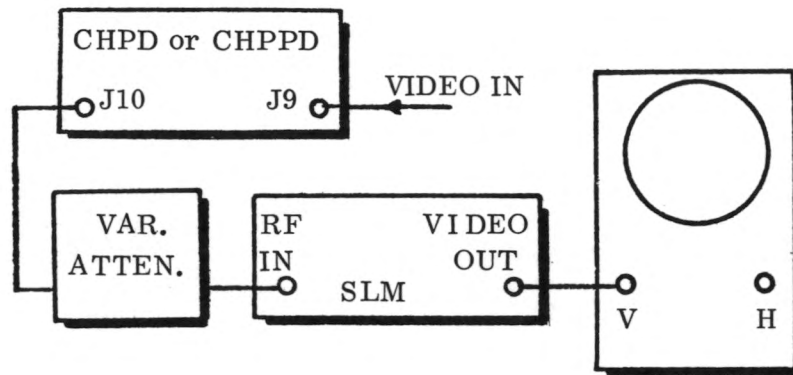


Fig. 12 Test Set-Up for Adjusting Depth of Video Modulation

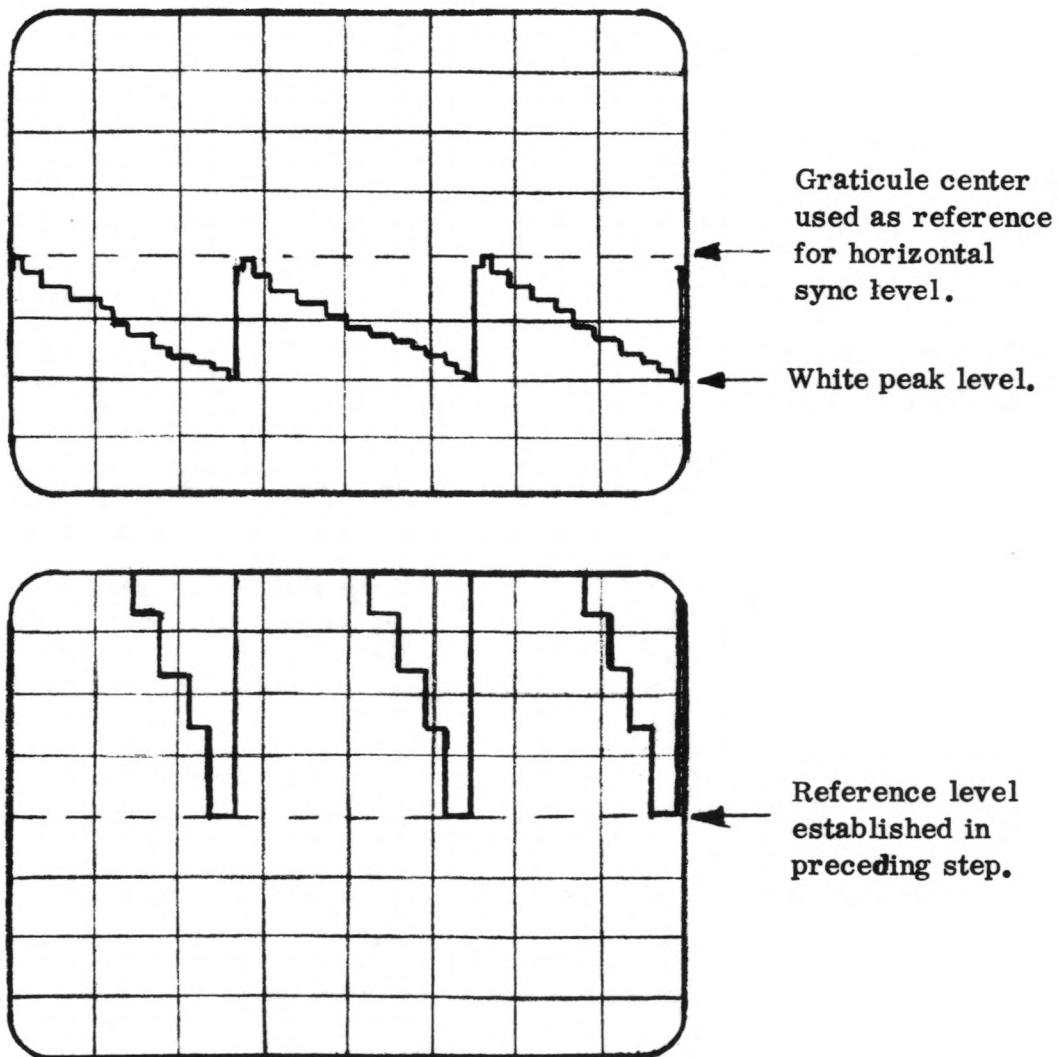


Fig. 13 Stair-case presentation for setting depth of video modulation.

connect the variable attenuator output to the RF input jack of a signal level meter and then connect the video output jack of the signal level meter to the vertical input of an oscilloscope. Set the oscilloscope for d.c. coupling and the variable attenuator to 0dB.

- 3.4.2 For a staircase presentation set the oscilloscope vertical sensitivity to 0.2 V/cm and the sweep rate to 20 μ s/cm to display 2 to 3 horizontal lines. Set the sync to " internal ". For program video set the sweep rate to 2 ms/cm to display one frame and set the sync to " line " (60 Hz).
- 3.4.3 Tune the signal level meter to the video carrier output frequency and set the step attenuator on the meter to obtain a reading between 0 and 10 dB.
- 3.4.4 Remove 20 dB from the step attenuator on the meter and then rotate the SIGNAL REPLACER MODULATION control R205 on the center drawer bottom clockwise to obtain a video waveform display on the oscilloscope. The waveform should be 1 to 1.5 V p-p maximum; if necessary, adjust the " compensator " control on the signal level meter for 1.5 V maximum. Slowly continue increasing the modulation until peak clipping is displayed, then slightly back up the setting to just below that level.
- 3.4.5 Insert attenuation into the variable attenuator corresponding to the desired depth of modulation as follows:
 - 18 dB for 87.5%
 - 16 dB for 84.0%
 - 15 dB for 80.0%
 - 12 dB for 75.0%
 - 11 dB for 70.0%

Increase the vertical sensitivity of the oscilloscope to 0.1 V/cm and adjust the presentation for a convenient display of the sync tips. Remove the attenuation from the variable attenuator inserted in the preceding step. Now adjust R205 until the peaks of the video waveform coincide with sync tip levels; see Fig.13.

- Notes:
- a. Where the video source signal does not include a VIT (vertical interval test) signal as a maximum white level reference, it is recommended that depth of modulation be set at 80% or less to prevent subsequent over-modulation.
 - b. Since a signal level meter has a relatively narrow-band detector, it may be necessary to reduce the maximum depth of modulation below 87.5% to compensate for the contribution of high frequency components.

Disconnect the test equipment , return the center drawer to normal operating position and reconnect the RF output cable to the Processor. If the RF input cable was removed for this test, also restore that cable to its jack on the Processor.

3.5 Depth of Modulation Setting with a TV Receiver.

- 3.5.1 It is assumed that the receiver is a well-adjusted set. Since the input to the set should be about 10 dBmV, it may be necessary to insert an in-line pad or a variable attenuator between the RF OUT terminal on the Processor rear panel and the TV set.
- 3.5.2 Adjust R205 on the CSR module through the bottom cover of the drawer until whitening and loss of detail becomes discernable in the bright areas of the TV picture. Now reduce the modulation setting until no whitening can be seen. This adjustment should be performed during the time the picture shows a high white content in order to prevent subsequent overmodulation.
- 3.5.3 Disconnect the TV receiver and return the center drawer to normal operating position. Reconnect the RF output cable to the processor and, if the RF input cable was removed for this test, also reconnect that cable to the processor.

4. SOUND TRAP FIELD ADJUSTMENT

4.1 Processor equipment, when subjected to severe handling during shipment, or when associated with offset broadcast frequency assignments at the antenna input, may require re-optimization of the accompanying and adjacent sound traps at the time of installation.

4.2 ADJACENT SOUND CARRIER TRAP ADJUSTMENT

Remove the top cover from the CHP main frame. Connect the normal R. F. signal and place the unit into normal operation.

4.2.1 Connect a spectrum analyzer to the R. F. output terminal and observe the relative level of the adjacent sound carrier.

4.2.2 Alternately adjust C607 and C612 on the filter Model IFF, located in the rear section of the main frame (see Fig. 15), for minimum adjacent sound carrier level. Make adjustments in small increments and repeat for optimum performance.

4.3 ACCOMPANYING SOUND TRAP ADJUSTMENT

This adjustment, if necessary, can also be performed with the Processor in normal operation. Extend the center drawer and remove the CIA cover.

4.3.1 a. With Signal Level Meter: Set the sound carrier level control to its maximum clockwise position. Connect a signal level meter to the R. F. or I. F. output and tune the meter to indicate the sound carrier level.

b. With Spectrum Analyzer: Connect the analyzer to the R. F. or I. F. output and observe the relative sound carrier level.

4.3.2 Remove P303 from the CIA P. C. board. Now carefully adjust each trimmer on the CIA sound trap box (see Fig. 16) for minimum sound carrier level as indicated by the meter or analyzer. A level of -35 dB or lower, relative to the video carrier level, is satisfactory for sound carrier regulation.

4.3.3 Replace P303 and reset the desired relative sound carrier level with the front panel SOUND CARRIER LEVEL control.

NOTE: Although normally not required at installation, the procedure described in section 4.2 may be used to re-optimize the adjacent video carrier rejector. In this case, adjust C609 and C601 for minimum adjacent video carrier level.

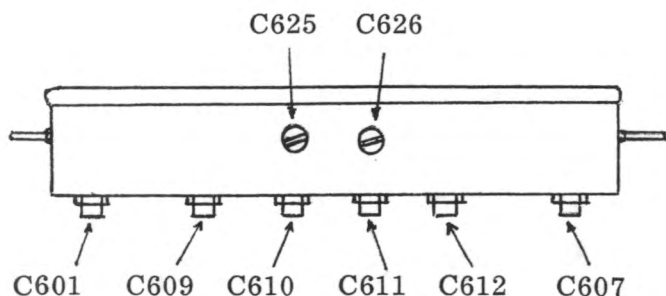


Fig. 15

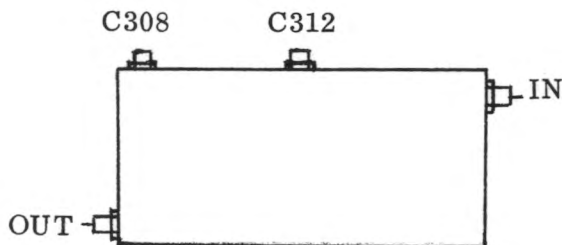


Fig. 16

COMMANDER III MODULATOR

INSTALLATION

1. BENCH INSTALLATION OF OPTIONAL MODULES

- 1.1 Both Models CIS and CSR are installed in the same manner as explained for the Processor in the preceding section.
- 1.2 Where a Model CST-4.5 Video/Audio Separator is needed as an interface to a microwave receiver install the CST-4.5 as conveniently as practicable at the rear of the Modulator.

2. MOUNTING

- 2.1 Rack or cabinet mounting of a Modulator is done in the same manner as explained for the Processor.

3. INPUT CONNECTIONS

- 3.1 The Modulator is designed to accept video and audio signals from any source, such as a video tape recorder, or microwave baseband video and 4.5 MHz aural carrier via the CST-4.5 referred to above.
- 3.2 Where the Modulator has been equipped with a CSR module, and the replacement signal is to be modulated, connect the standby video source to the AUX STBY MOD IN terminal at the Modulator rear panel and, if required, the override control lead to terminal #4 on TB1.
- 3.3 Where the Modulator has been equipped with a CIS module, connect the "event output" leads from the PC-6 to terminal #7 (NORMAL IF) and terminal #8 (PROGRAM IF) of TB1, and then connect the ground terminal #6 of J1 on the PC-6 to the #1 terminal of TB1 on the modulator.
- 3.4 Connect the alternate IF input to the IF IN PROGRAM coaxial terminal on the Modulator rear panel.

4. INTERCONNECTIONS

- 4.1 The Modulator is factory-equipped with an INPUT AUDIO/4.5MHz switch, factory-set to the AUDIO position. Where a 4.5 MHz input is used, the switch which is located at the top of the CAM circuit board must be reset to the 4.5 MHz position; unlock the bolt on the module front panel, pull out the module and reset the switch; then return the module to operating position.

- 4.2 Connect the video source to the VIDEO IN terminal on the modulator rear panel.
- 4.3 For connection of the audio source to the AUDIO IN " Cannon " jack on the modulator rear panel a separately procured " Cannon " plug is required. Installation of the this plug is as follows (see Fig.14) :
- Push the protective rubber boot into the barrel so that it is properly seated in the groove of the barrel collar.
 - Mate the collar clamp with the barrel, slightly engaging the two clamp screws.
 - Slide the barrel well up over the wire harness (3-wire cable) then slide the insulating bushing over the harness towards the barrel.
 - Prepare and tin the wire ends and then solder them into their associated pins; pin #1 is the common, and pins #2 and 3 are the signal carrying pins.
 - Slide the barrel forward and push the plug into the barrel so that the key on the plug fits into the keyway of the inner surface of the barrel.
 - Force the plug all the way into the barrel until the threaded hole of the plug matches with the hole in the barrel; then secure the plug with the small screw supplied in the bag.
 - Tighten the two screws on the barrel collar clamp.

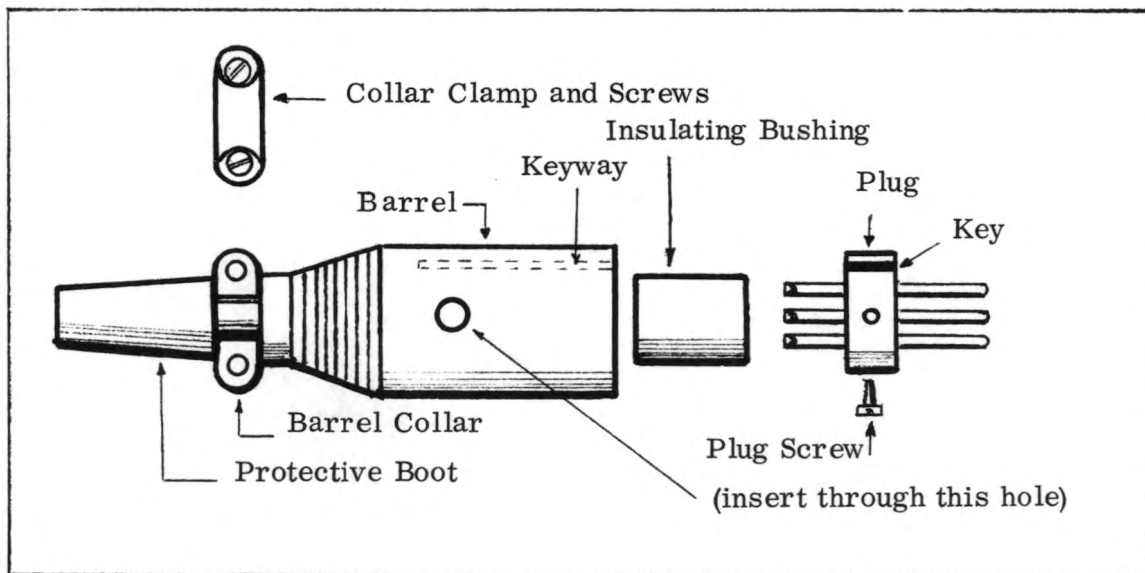


Fig. 14 INSTALLATION OF CANNON PLUG
Model XLR-3-12SC

- 4.4 With the coaxial jumper supplied, connect the IF OUT terminal to the IF IN NORMAL terminal on the Modulator rear panel, except where programming is employed; see the relevant instructions in the Processor section.
- 4.5 Connect the RF OUT terminal on the Modulator rear panel through a coaxial jumper of sufficient length to the associated input terminal on the head-end combiner.

- 4.6 Where a phaselock-equipped Model CMMP-* is involved, the only additional connection required is the coaxial cable carrying the off-air reference channel to be attached to the PHASELOCK REF. IN terminal at the Modulator rear panel.
- 4.7 Where a microwave source and the CST-4.5 are used, connect one of the two jumpers supplied with the CST-4.5 between the VIDEO terminal on the CST-4.5 and the VIDEO IN terminal on the Modulator rear panel; connect the second jumper between the 4.5 MHz terminal on the CST-4.5 and the 4.5 MHz IN terminal on the Modulator rear panel.

OPERATION

1. TURN-ON

- 1.1 Plug the line cord of the Modulator into the associated AC outlet; the AC POWER pilot lamp on the front panel should come on. Then flip the B+ switch on the front panel to the ON position; the B+ pilot lamp should be lit.
- 1.2 If the Modulator is equipped for phaselock (ICCP module) the \emptyset LOCK / UNLOCK and REF OFF pilot lights should go dark even after initial blinking.
- 1.3 Set the rotary METER FUNCTION switch to the B+ position and check the meter reading; it should be +20 VDC on the B+ scale. Where a phaselocked unit is used, set the METER FUNCTION switch to the \emptyset LOCK position; the indicator on the meter should stay in the green area of the scale. A short period may pass until the AGC circuitry stabilizes after switching from MANUAL to AGC position.

2. OUTPUT LEVEL SETTING

The same procedure as given for the Processor applies here.

3. DEPTH OF VIDEO MODULATION SETTING

- 3.1 Set the METER FUNCTION switch to the VIDEO MOD position and, if needed, adjust the VIDEO MOD control on the CAM front panel for a reading of 87.5% on the meter scale.

Note: Where the video signal does not include a VIT (vertical interval test) or other waveform with a reference for maximum white level, it is recommended to reduce the depth of modulation to 80% or less to prevent over - modulation at a later time.

4. DEPTH OF VIDEO MODULATION SETTING ON CSR MODULE.

The same procedure as given for the Processor applies here.

5. SOUND CARRIER ADJUSTMENT

- 5.1 Connect a signal level meter through the PMG-61F adapter to the IF -30dB TEST terminal on the center drawer; tune the meter to the 41.25 MHz sound carrier and, if needed, adjust the SOUND CARRIER LEVEL control on the CAM front panel to obtain a reading of -15 dB relative to the video carrier level, or as may be otherwise required by system design. Disconnect the meter.

Note: The IF LEVEL potentiometer R330 on top of the center drawer cover is factory-set and does not require adjustment for initial set-up!

6. AUDIO MODULATION ADJUSTMENT

- 6.1 Set the METER FUNCTION switch to the AUDIO MOD position and , if needed, adjust the SOUND DEVIATION control on the CAM module to obtain a meter reading of 25 kHz during audio peaks.

Note: The two DEVIATION test jacks on the CAM module allow the connection of a set of 600-ohm impedance earphones for monitoring the audio signals applied to the Modulator. The jacks also permit connection of a VOM or VTVM when it is desired to adjust the SOUND DEVIATION control; in that case, the normal audio input signal to the AUDIO IN terminal on the Modulator rear panel should be disconnected and replaced by a 400 Hz tone at the desired peak program audio level.

This completes the operational set-up of the Modulator.

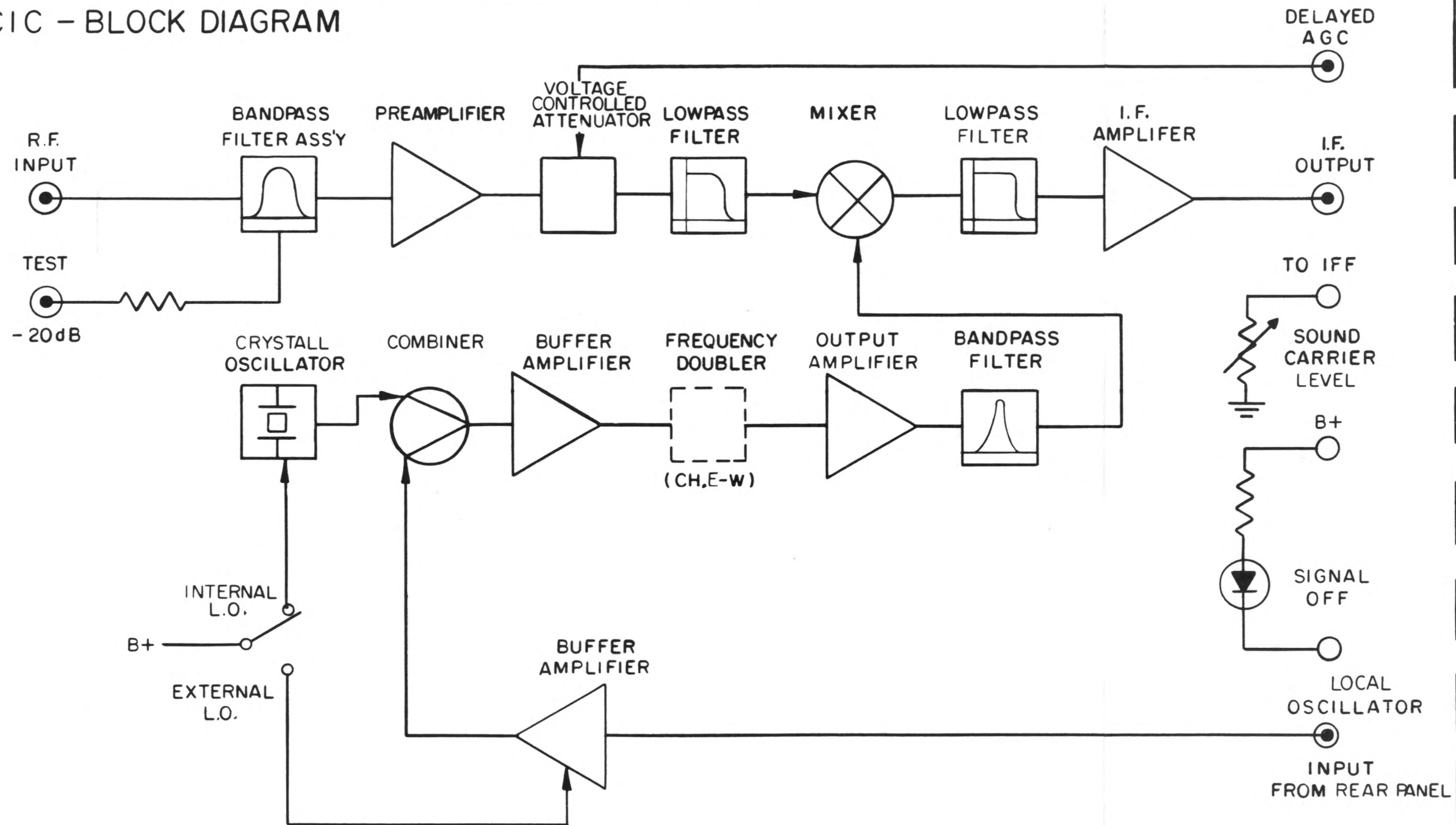
MAINTENANCE

A detailed troubleshooting and alignment procedure for Commander III equipment will be published as soon as possible and holders of this manual will automatically receive copies. Functional block diagrams and interconnection wiring schematics are appended here.

All data subject to change without notice.

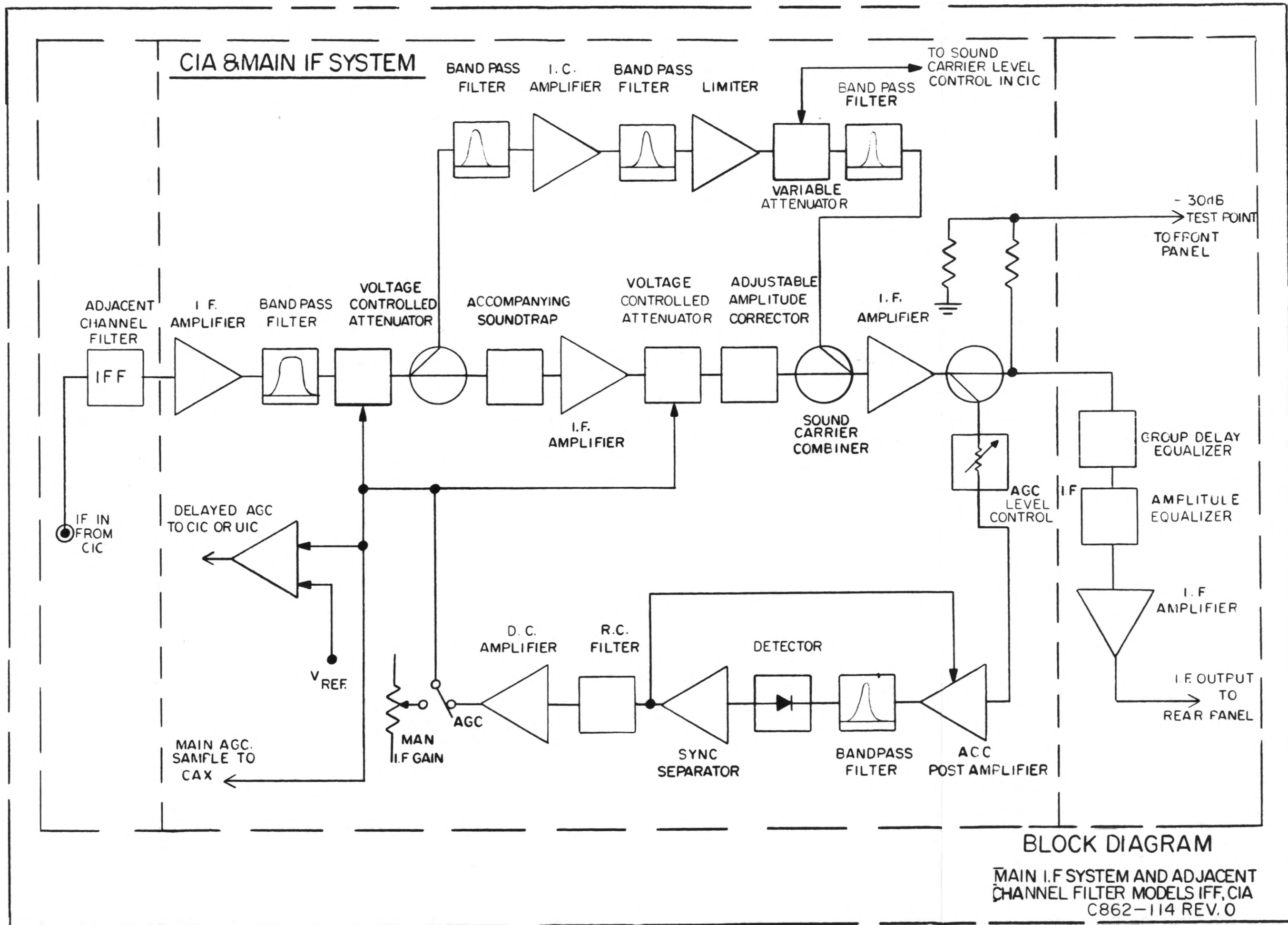
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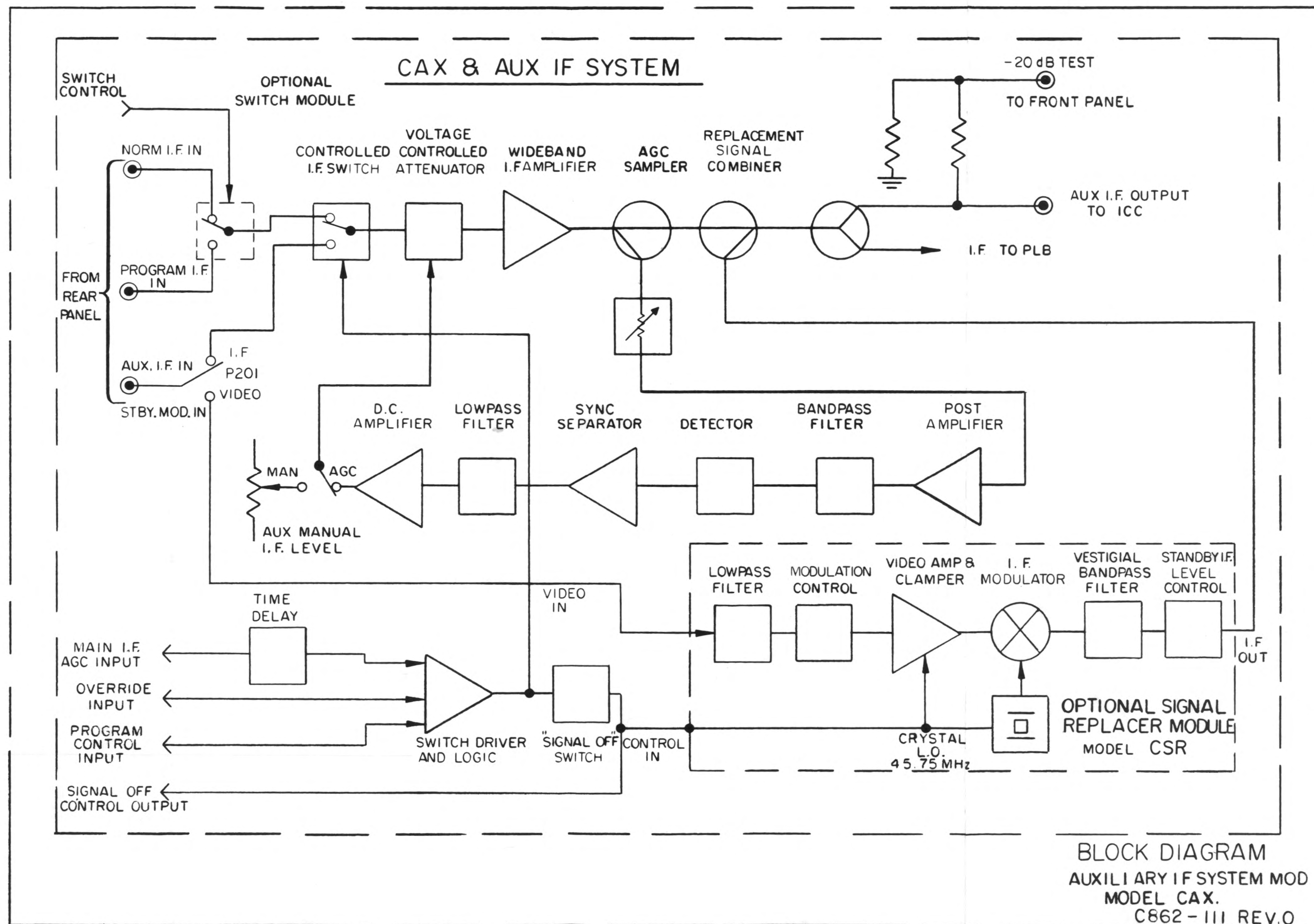
CIC - BLOCK DIAGRAM



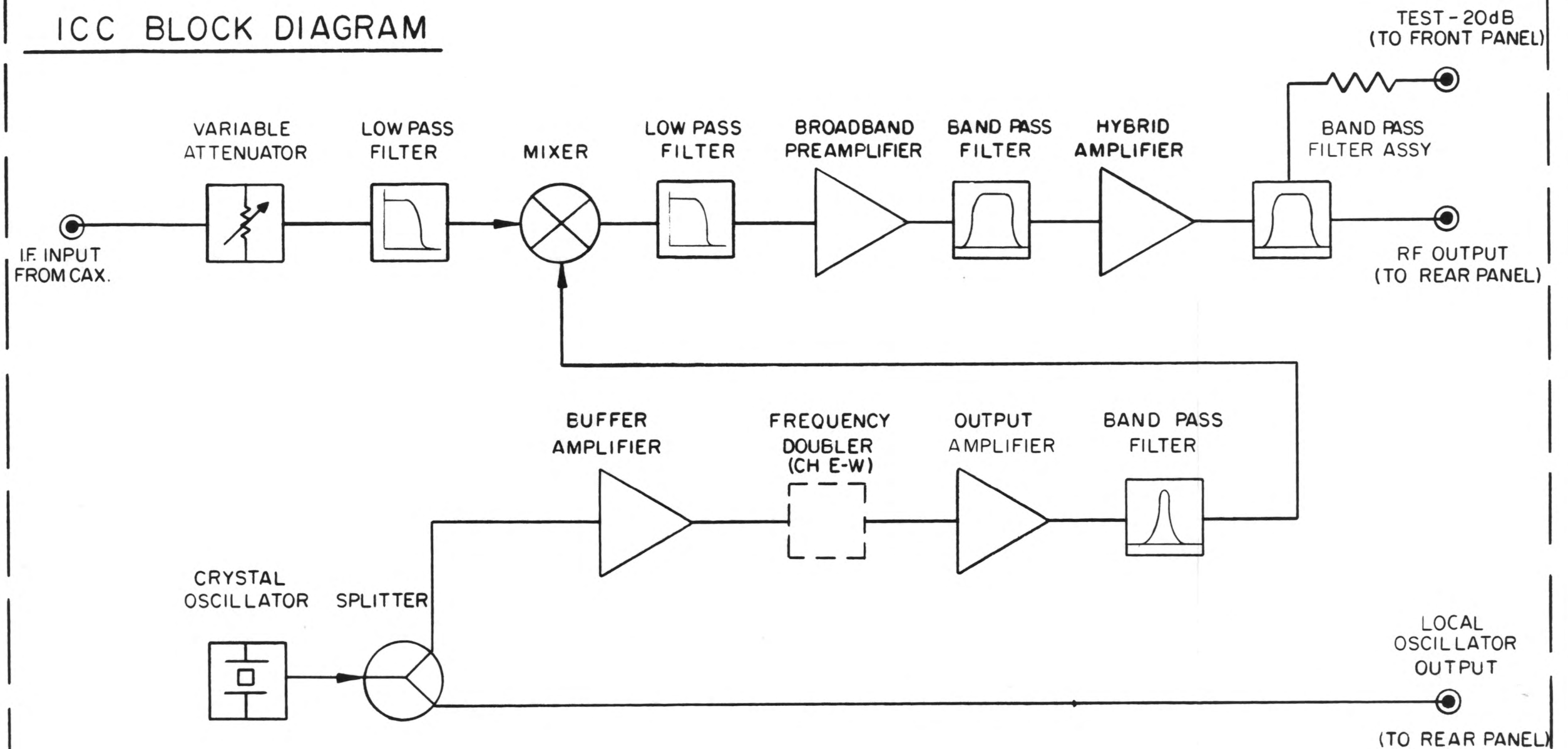
BLOCK DIAGRAM
CHANNEL TO I.F. CONVERTER
MODULE — MODEL CIC-*

D862-113 REV. 0





ICC BLOCK DIAGRAM

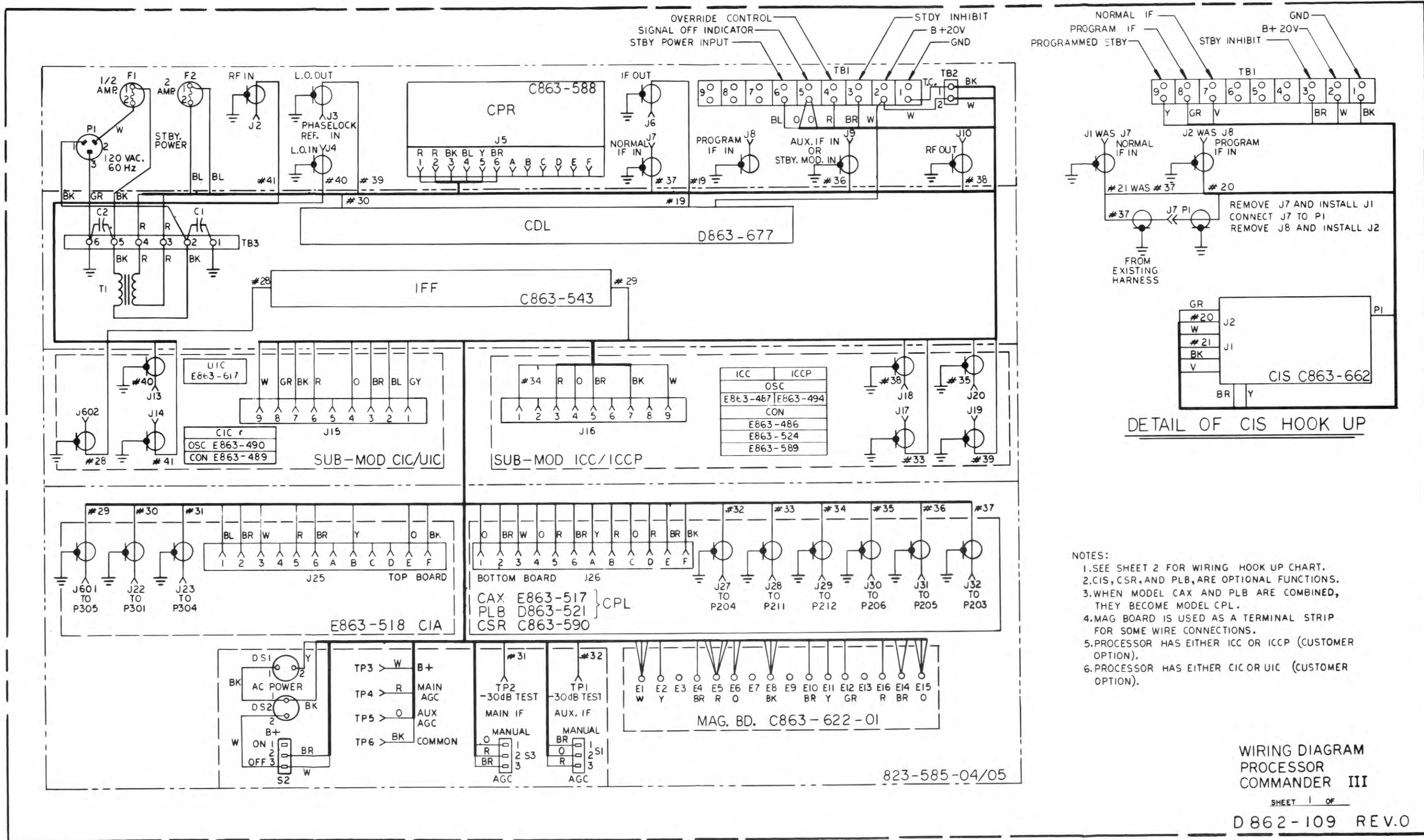


BLOCK DIAGRAM
I. F. TO CHANNEL CONVERTER
MODULE MODEL ICC-*

C862-112 REV.0

REPLACEMENT PARTS LIST

| MODEL PMF | |
|---------------------------------------------|------------------|
| ASSEMBLY No. 812-407 | |
| DRAWING No. 862-109 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2 | 124-032 |
| FUSES | |
| F1 | 101-335 |
| F2 | 101-352 |
| FUSE HOLDERS | |
| F1, F2 | 101-811 |
| LAMPS | |
| DS1 (Amber) | 102-302 |
| DS2 (Green) | 102-303 |
| SWITCHES | |
| S1, S2, S3 | 162-045 |
| TRANSFORMER | |
| T1 | C141-309-00 |



| FROM | TO | REMARKS |
|---------------|-----------------|--------------------------|
| P1 PIN 1 | TB3 TERM 2 | BK LINE CORD |
| P1 PIN 2 | F1 TERM 2 | W LINE CORD |
| P1 PIN 3 | TB3 TERM 6 | GR LINE CORD |
| F1 TERM 1 | TB3 TERM 5 | BK #22 WIRE |
| F2 TERM 1 | J5 PIN 4 OR | BL #22 WIRE |
| F2 TERM 2 | TB1 PIN 6 | BL #22 WIRE |
| TB3 TERM 1 | TB3 TERM 2 | C1, .01 μ F, 1000VDC |
| TB3 TERM 2 | T1 PRIMARY | BK #22 WIRE |
| TB3 TERM 3 | T1 SECONDARY | R #22 WIRE |
| TB3 TERM 3 | J5 TERM 1 OR | R #22 WIRE |
| TB3 TERM 4 | J5 TERM 2 | R #22 WIRE |
| TB3 TERM 4 | T1 SECONDARY | R #22 WIRE |
| TB3 TERM 5 | TB3 TERM 6 | C2, .01 μ F, 1000VDC |
| TB3 TERM 5 | T1 PRIMARY | BK #22 WIRE |
| J2 | J14 | COAXIAL #41 |
| J3 | J19 | COAXIAL #39 |
| J4 | J13 | COAXIAL #40 |
| J5 PIN 3 | TB2 TERM 1 | BK #22 WIRE |
| J5 PIN 5 | DS1 PIN 2 | Y #22 WIRE |
| J5 PIN 6 | S2 TERM 2 | BR #22 WIRE |
| J5 PIN A TO F | NOT CONNECTED | |
| J6 | CDL BOX | COAXIAL #19 |
| J7 | J32 | COAXIAL #37 |
| J8 | NOT CONNECTED | |
| J9 | J31 | COAXIAL #36 |
| J10 | J18 | COAXIAL #38 |
| TB1 TERM 1 | TB2 TERM 1 | #22 T.C. |
| TB1 TERM 2 | TB2 TERM 2 | W #22 WIRE |
| TB1 TERM 2 | CDL BOX | W #22 WIRE |

SEE NOTE 1

| FROM | TO | REMARKS |
|-------------------|---------------|-------------|
| TB1 TERM 3 | J26 PIN 6 | BR #22 WIRE |
| TB1 TERM 4 | J26 PIN D | R #22 WIRE |
| TB1 TERM 5 | J26 PIN C | O #22 WIRE |
| TB1 TERM 5 | J15 PIN 4 | O #22 WIRE |
| TB1 TERM 7, 8 & 9 | NOT CONNECTED | |
| TB2 TERM 1 | J15 PIN 7 | BK #22 WIRE |
| TB2 TERM 1 | J16 PIN 7 | BK #22 WIRE |
| TB2 TERM 1 | J25 PIN F | BK #22 WIRE |
| TB2 TERM 1 | J26 PIN F | BK #22 WIRE |
| TB2 TERM 1 | E8 | BK #22 WIRE |
| TB2 TERM 2 | J15 PIN 9 | W #22 WIRE |
| TB2 TERM 2 | J16 PIN 9 | W #22 WIRE |
| TB2 TERM 2 | J25 PIN 3 | W #22 WIRE |
| TB2 TERM 2 | J26 PIN 3 | W #22 WIRE |
| TB2 TERM 2 | E1 | W #22 WIRE |
| J11 | NOT USED | |
| J602 | IFF BOX | COAXIAL #28 |
| J15 PIN 1 | N.C. | GY #22 WIRE |
| J15 PIN 2 | J25 PIN 1 | BL #22 WIRE |
| J15 PIN 3 | J25 PIN 2 | BR #22 WIRE |
| J15 PIN 5 | NOT CONNECTED | |
| J15 PIN 6 | N.C. | R #22 WIRE |
| J15 PIN 8 | E12 | GR #22 WIRE |
| J16 PIN 1 | J29 | COAXIAL #34 |
| J16 PIN 2, 6 & 8 | NOT CONNECTED | |
| J16 PIN 3 | J26 PIN B | R #22 WIRE |
| J16 PIN 4 | J26 PIN 1 | O #22 WIRE |
| J16 PIN 5 | J26 PIN 2 | BR #22 WIRE |
| J17 | J28 | COAXIAL #33 |
| J20 | J30 | COAXIAL #35 |
| J601 | IFF BOX | COAXIAL #29 |

| FROM | TO | REMARKS |
|------------------|---------------|-------------|
| J22 | CDL BOX | COAXIAL #30 |
| J23 | TP2 | COAXIAL #31 |
| J25 PIN 4 | NOT CONNECTED | |
| J25 PIN A, C & D | NOT CONNECTED | |
| J25 PIN 5 | E5 | R #22 WIRE |
| J25 PIN 6 | E10 | BR #22 WIRE |
| J25 PIN B | E2 | Y #22 WIRE |
| J25 PIN E | E6 | O #22 WIRE |
| J26 PIN 4 | E15 | O #22 WIRE |
| J26 PIN 5 | E5 | R #22 WIRE |
| J26 PIN A | E11 | Y #22 WIRE |
| J26 PIN E | E14 | BR #22 WIRE |
| J27 | TP1 | COAXIAL #32 |
| DS1 PIN 1 | DS2 PIN 1 | BK #22 WIRE |
| DS2 PIN 1 | E8 | BK #22 WIRE |
| DS2 PIN 2 | S2 PIN 3 | W #22 WIRE |
| S1 TERM 1 | E14 | BR #22 WIRE |
| S1 TERM 2 | E15 | O #22 WIRE |
| S1 TERM 3 | E16 | R #22 WIRE |
| S2 TERM 1 | NOT CONNECTED | |
| S2 TERM 3 | E1 | W #22 WIRE |
| S3 TERM 1 | E6 | O #22 WIRE |
| S3 TERM 2 | E5 | R #22 WIRE |
| S3 TERM 3 | E4 | BR #22 WIRE |
| TP3 | E1 | W #22 WIRE |
| TP4 | E5 | R #22 WIRE |
| TP5 | E15 | O #22 WIRE |
| TP6 | E8 | BK #22 WIRE |
| E3, E7, E9 & E13 | NOT CONNECTED | |

NOTE:

1. COAXIAL IDENTIFICATION NUMBER IS EQUIVALENT TO TAB NUMBER OF CABLE ASSEMBLY DRAWING D811-878 (EXAMPLE: #37 = 811-878-37).

WIRING DIAGRAM
PROCESSOR
COMMANDER III

862-109
SHEET 2 OF

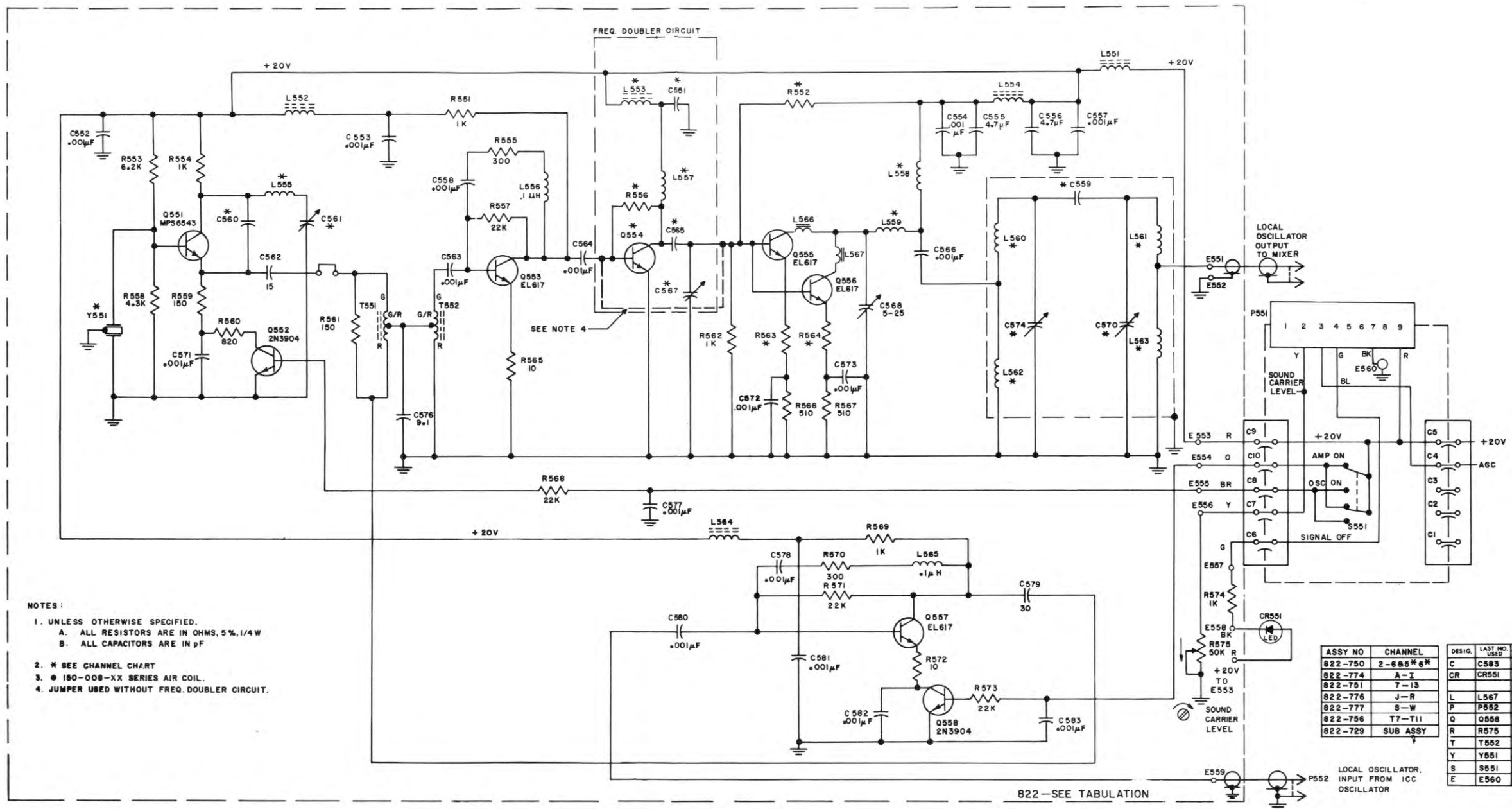
REPLACEMENT PARTS LIST

| MODEL CIC OSCILLATOR | |
|-----------------------------------------------------------------------------------------------------------------------------|---------------------|
| ASSEMBLY No. 822-729 | |
| DRAWING No. 863-490 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C552, C553, C544, C557, C558, C563, C564, C566, C571, C572, C573, C577, C578, C580, C581, C582, C583 C555, C556 | 124-077 |
| C562 | 127-079 |
| C568 | 124-143 |
| C576 | 128-230-00 |
| C579 | 124-108 |
| | 124-121-00 |
| LED | |
| CR551 | 102-026-00 |
| RESISTORS | |
| R551, R554, R562, R569, R574 R553 | 112-977 |
| R555, R570 | 112-981 |
| R557, R568, R571, R573 R558 | 112-096 |
| R559, R561 | 111-015 |
| R560 | 111-006 |
| R565, R572 | 112-974 |
| R565, R566 | 112-976 |
| R575 | 112-077 |
| | 112-929 |
| | S118-253-00 |
| SWITCH | |
| S551 | 162-022 |
| TRANSFORMERS | |
| T551 | C144-417-00 |
| T552 | C144-416-00 |
| TRANSISTORS | |
| Q551 | 130-194 |
| Q552, Q558 | 130-226 |
| Q553, Q555, Q556, Q557 | S130-607 |

| MODEL CIC OSCILLATOR, 2-6, 5*, 6* | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-750 | |
| DRAWING No. 863-490 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C559-2, 3 | 122-091 |
| C559-4, 5* | 122-055 |
| C559-5, 6, 6* | 122-101 |
| C560 | 124-087 |
| C561 | 128-230-00 |
| C570, C574 | 128-568 |
| CRYSTALS | |
| Y551-2 | \$139-279-00 |
| Y551-3 | \$139-279-01 |
| Y551-4 | \$139-279-02 |
| Y551-5 | \$139-279-03 |
| Y551-6 | \$139-279-04 |
| Y551-5* | \$139-279-38 |
| Y551-6* | \$139-279-39 |
| RESISTORS | |
| R552 | 112-979 |
| R563, R564 | 112-992 |

| MODEL CIC OSCILLATOR, 7-13 | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-751 | |
| DRAWING No. 863-490 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C551, C565 | 124-077 |
| C559 | 122-047 |
| C560 | 124-087 |
| C561, C567 | 128-230-00 |
| C570, C574 | 128-546 |
| CRYSTALS | |
| Y551-7 | S139-279-10 |
| Y551-8 | S139-279-11 |
| Y551-9 | S139-279-12 |
| Y551-10 | S139-279-13 |
| Y551-11 | S139-279-14 |
| Y551-12 | S139-279-15 |
| Y551-13 | S139-279-16 |
| RESISTORS | |
| R552 | 122-966 |
| R556 | 111-074 |
| R563, R564 | 112-077 |
| TRANSISTOR | |
| Q554 | S130-607 |

| MODEL CIC OSCILLATOR, T7-T11 | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-756 | |
| DRAWING No. 863-490 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C559-T7 | 122-085 |
| C559-T8 | 122-055 |
| C559-T9 | 122-101 |
| C559-T10 | 122-071 |
| C559-T11 | 122-103 |
| C560 | 124-079 |
| C561 | 128-230-00 |
| C570, C574 | 128-568 |
| CRYSTALS | |
| Y551-T7 | S139-279-40 |
| Y551-T8 | S139-279-41 |
| Y551-T9 | S139-279-42 |
| Y551-T10 | S139-279-43 |
| Y551-T11 | S139-279-44 |
| RESISTORS | |
| R552 | 112-979 |
| R563, R564 | 112-992 |



| COMPONENT | CHANNELS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------|----------|-----|-----|---------|-----|-----|-----|-----|-----|-----|----------|-----|--------|-----|-----|-----|-----|-----|-----|---------|-----|-----|-----|-----|-----|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|--------|-----|-----|-----|-----|-----|--|-------|--|--|--|--|
| | 2 | 3 | 4 | 5 | 6 | 5* | 6* | 7 | 8 | 9 | 10 | 11 | 12 | 13 | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W | T7 | T8 | T9 | T10 | T11 | | | | | | |
| R556 | | | | | | | | | | | 91 K | | | | | | | | | | | | | | | | | | 91 K | | | | | | | | | | | | | | | | | | | |
| R552 | | | | 3.9 K | | | | | | | | | | | | | | | | 1.5 K | | | | | | | | | | | | | | | | | | | | | | | | 3.9 K | | | | |
| R563 | | | | 4.7 | | | | | | | | | | | | | | | | 10 | | | | | | | | | | | | | | | | | | | | | | | | 4.7 | | | | |
| R564 | | | | 4.7 | | | | | | | | | | | | | | | | 10 | | | | | | | | | | | | | | | | | | | | | | | | 4.7 | | | | |
| C551, C565 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C559 | 1.2 | 1.0 | .82 | | | | | | | | .001μF | | | | | | | | | .33 | | .24 | | | | | .20 | | | | | | | | | | | | | | | | | | | | | |
| C560 | | | | | | | | | | | .24 | | | | | | | | | .39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C561 | | | | | | | | | | | 4.3 | | | | | | | | | .39 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C567 | | | | | | | | | | | 5-25 | | | | | | | | | 2.5-9 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C570 | | | | 5.5-18 | | | | | | | 5-25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| C574 | | | | 5.5-18 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L553 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L555 | | | | | | | | | | | B155-414 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L557 | | | | | | | | | | | .47μH | | | | | | | | | .33μH | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L558 | | | | 2 1/2 T | | | | | | | 1 1/2 T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L559 | | | | 5 1/2 T | | | | | | | 1 1/2 T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L560 | | | | 5 1/2 T | | | | | | | 1 1/2 T | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L561 | | | | 5 1/2 T | | | | | | | 1 1/2 T | | | | | | | | | 4 1/2 T | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L562 | | | | 2 1/2 T | | | | | | | 1 1/2 T | | | | | | | | | 1 1/2 T | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| L563 | | | | 2 1/2 T | | | | | | | 1 1/2 T | | | | | | | | | 1 1/2 T | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Q554 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Y551 | (30-279) | -01 | -02 | -03 | -04 | -38 | -39 | -10 | -11 | -12 | -13 | -14 | -15 | -16 | -29 | -30 | -31 | -32 | -05 | -06 | -07 | -08 | -09 | -17 | -18 | -19 | -20 | -21 | -22 | -26 | -27 | -28 | -33 | -34 | -35 | -36 | -37 | -40 | -41 | -42 | -43 | -44 | | | | | | |
| | JUMPER | | | | | | | | | | | | JUMPER | | | | | | | | | | | | | | | | | | | | | | | | JUMPER | | | | | | | | | | | |

REPLACEMENT PARTS LIST

| MODEL CIC CONVERTER, 2-6, 7-13 | |
|------------------------------------------------------------------------------------------------------------|------------------|
| ASSEMBLY No. 822-728-00 | |
| DRAWING No. 863-489 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C501, C502, C506, C507, C508, C509, C516, C522, C523, C524, C525, C526, C527, C528, C529, C530, C534, C535 | S124-078 |
| C503 | 122-085 |
| C504 | 124-139-00 |
| C505 | 124-087-00 |
| C515, C517 | 122-066 |
| C518 | 126-188 |
| C519 | S126-230-57 |
| C520 | S126-230-55 |
| C521 | S126-230-09 |
| C532 | 126-230-33 |
| DIODES | |
| CR501, CR502 | S137-309 |
| CR503, CR504, CR505, CR506 | 137-840 |
| JUMPER | |
| P501 | 184-103-00 |
| RESISTORS | |
| R501 | 112-994 |
| R502, R504 | 112-929 |
| R503 | 112-064 |
| R505 | 112-104 |
| R506, R507 | 112-954 |
| R508 | 112-950 |
| R509 | 112-919 |
| R511 | 112-936 |
| R512 | 112-099 |
| R513 | 112-082 |
| R514 | 112-078 |
| R516 | 112-980 |
| R517 | 111-005 |
| R518 | 112-079 |
| R519 | 112-100 |
| R520 | 112-920 |
| TRANSFORMERS | |
| T501, T504 | B144-734-00 |
| T502, T503 | B144-735-00 |
| T505, T506 | B144-350 |
| TRANSISTOR | |
| Q502 | S130-265-01 |

| MODEL CIC CONVERTER, 2-6, 5* 6* | |
|---------------------------------------------|------------------|
| ASSEMBLY No. 822-748 | |
| DRAWING No. 863-489 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C510-2, 3, 4 | 124-115 |
| C510-5, 6, 5*, 6* | 124-139 |
| C511 | 124-087 |
| C512 | 124-079 |
| C513 | 124-126 |
| C514-2, 3, 4 | 124-137 |
| C514-5, 6, 5*, 6* | 124-139 |
| C535 | 124-214 |
| RESISTORS | |
| R510 | 112-976 |
| R515 | 112-077 |
| TRANSISTOR | |
| Q501 | 130-604 |

| MODEL CIC CONVERTER, 7-13 | |
|---------------------------------------------|------------------|
| ASSEMBLY No. 822-749 | |
| DRAWING No. 863-489 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C510-7, 8, 9, 10 | 124-115-00 |
| C510-11, 12, 13 | 124-103-00 |
| C511-7, 8, 9, 10 | 124-108-00 |
| C511-11, 12, 13 | 124-112-00 |
| C512-7, 8, 9, 10 | 124-103-00 |
| C512-11, 12, 13 | 124-084-00 |
| C513-7, 8, 9, 10 | 124-079-00 |
| C513-11, 12, 13 | 124-103-00 |
| C514-7, 8, 9, 10 | 124-115-00 |
| C514-11, 12, 13 | 124-072-00 |
| C533 | 124-214-00 |
| RESISTORS | |
| R510 | 112-976 |
| R515 | 112-070 |
| TRANSISTOR | |
| Q501 | 130-616-00 |

| MODEL CIC CONVERTER, T7-T11 | |
|------------------------------------------------------------------------------------------------------------|------------------|
| ASSEMBLY No. 822-780 | |
| DRAWING No. 863-489 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C501, C502, C506, C507, C508, C509, C516, C522, C523, C524, C525, C526, C527, C528, C529, C530, C534, C535 | S124-078 |
| C503 | 122-085 |
| C504 | 124-139 |
| C505 | 124-087 |
| C510-T7, T8, T9 | 124-079 |
| C510-T10, T11 | 124-115 |
| C511-T7, T8, T9 | 124-139 |
| C511-T10, T11 | 124-061-00 |
| C512-T7, T8, T9 | S126-230-57 |
| C512-T10 | S126-230-35 |
| C512-T11 | 124-138 |
| C513-T7, T8, T9 | 126-088 |
| C513-T10, T11 | S126-230-73 |
| C514-T7 | 124-108-00 |
| C514-T8, T9 | S126-230-64 |
| C514-T10, T11 | S126-230-35 |
| C515, C517 | 122-066 |
| C518 | S126-230-26 |
| C519 | S126-230-57 |
| C520 | S126-230-55 |
| C521 | S126-230-09 |
| C531 | 128-572 |
| C533 | 124-066 |
| DIODES | |
| CR501, CR502 | S137-309 |
| CR503, CR504, CR505, CR506 | 137-840 |
| JUMPER | |
| P501 | 184-103-00 |
| RESISTORS | |
| R501 | 112-994 |
| R502, R504 | 112-929 |
| R503 | 112-064 |
| R505 | 112-104 |
| R506, R507 | 112-954 |
| R508 | 112-950 |
| R509 | 112-919 |
| R510 | 112-998 |
| R511 | 112-931 |
| R512 | 112-099 |
| R513 | 112-971 |
| R515 | 112-077 |
| R516 | 112-980 |
| R517 | 111-005 |
| R518 | 112-079 |
| R519 | 112-100 |
| R520 | 112-920 |
| TRANSFORMERS | |
| T501, T504 | B144-734-00 |
| T502, T503 | B144-735-00 |
| T505, T506 | B144-350 |
| TRANSISTORS | |
| Q501 | 130-604 |
| Q502 | S130-265-01 |

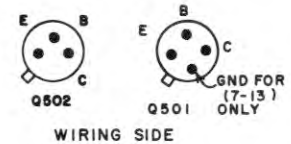
| COMPONENT | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | T7 | T8 | T9 | T10 | T11 |
|-----------|--------|---|-----|---|---------|---|---|--------|----|--------|-----|-----|--------|-----|---------|------|-----|
| C510 | 13 | | | | 6.2 | | | | 13 | | | 8.2 | | 18 | | 13 | |
| C511 | | | 4.3 | | | | | 9.1 | | | 6.8 | | 6.2 | | | 4.7 | |
| C512 | | | | | | | | 8.2 | | | 5.6 | | 82 | | 62 | 56 | |
| C513 | | | 39 | | | | | 18 | | | 8.2 | | 150 | | | 100 | |
| C514 | 10 | | | | 6.2 | | | 13 | | | 7.5 | | 9.1 | | 91 | 62 | |
| C531 | | | | | | | | | | | | | | | | | |
| C533 | | | | | .022μF | | | | | | | | | | 0.47 | | |
| L502 | 7 1/2T | | | | 6 1/2 T | | | 2 1/2T | | 1 1/2T | | | 2 1/2T | | | 10.5 | |
| L503 | 8 1/2T | | | | 6 1/2 T | | | | | | | | | | | 11.5 | |
| L514 | | | | | | | | | | | | | 2.2 | 1.8 | | 1.2 | |
| R510 | | | | | 820 | | | | | | | | | | 620 | | |
| R515 | | | | | 10 | | | | | | | | | | 12 | | |
| Q501 | | | | | 130-604 | | | | | | | | | | 130-604 | | |
| C518 | | | | | | | | 24 | | | | | | | 53 | | |
| R513 | | | | | | | | 18 | | | | | | | 22 | | |

NOTES:

1. ALL RESISTORS ARE IN OHMS, 5%, 1/4W.
2. ALL CAPACITORS ARE IN pF.
3. ALL UNMARKED CAPACITORS ARE .02μF.
4. ALL INDUCTORS ARE IN μH.
5. ** INDICATES T CH. ONLY.
6. † DELETE FOR T CH.
7. * SEE CHANNEL CHART

| DESIG. | LAST NO. USED | NUMBERS NOT USED | DESIG. | LAST NO. USED | NUMBERS NOT USED |
|--------|---------------|------------------|--------|---------------|------------------|
| C | C535 | | T | T506 | |
| GR | CR506 | | L | L515 | |
| J | J505 | | TP | TP502 | |
| P | P505 | | E | E503 | |
| Q | Q502 | | | | |
| R | R520 | | | | |

| ASS'Y NO. | CHANNEL |
|-----------|-----------|
| 822-748 | 2-6 5* 6* |
| 822-749 | 7-13 |
| 822-780 | T7-T11 |
| 822-728 | SUB-ASS'Y |



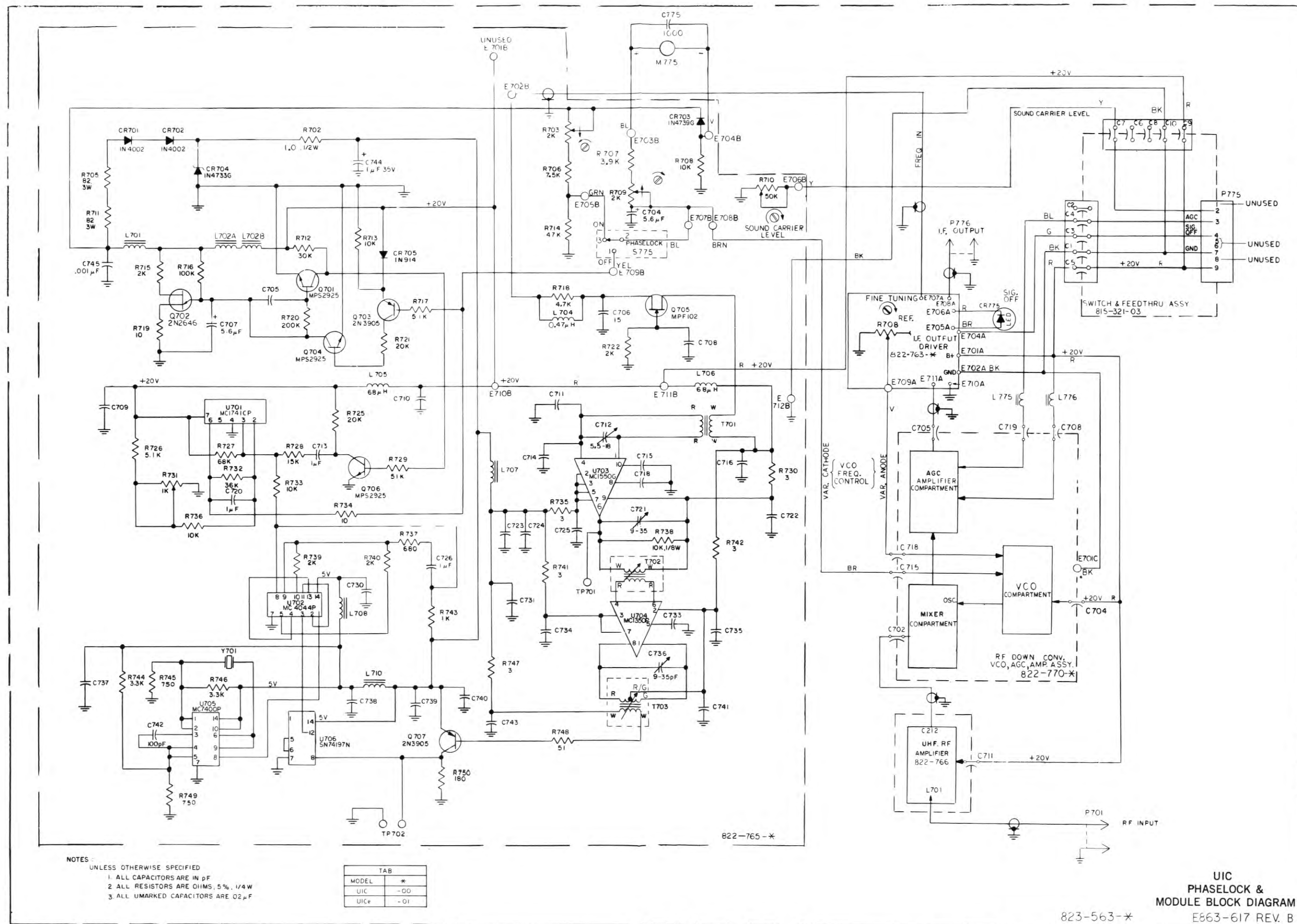
CIC CONVERTER
E 863-489 REV O

REPLACEMENT PARTS LIST

| MODEL UIC | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|
| ASSEMBLY No. 822-765-00 | |
| DRAWING No. 863-617 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C704, C707 | 127-328 |
| C705, C708, C709, C710, C711, C714, C715, C716, C718, C722, C723, C724, C725, C730, C731, C733, C734, C735, C737, C738, C739, C740, C741, C743 | S124-078-00 |
| C706 | 126-125-00 |
| C712 | 128-566-00 |
| C713, C720, C726 | S124-188 |
| C721, C736 | 128-565-00 |
| C742 | 126-091 |
| C744 | 127-316 |
| C745 | 124-049 |
| C775 | 124-077 |
| CRYSTAL | |
| Y701 | S139-280-00 |
| DIODES | |
| CR701, CR702 | S137-686 |
| CR703 | S137-830 |
| CR704 | 137-805 |
| CR705 | 139-169 |
| INTEGRATED CIRCUIT | |
| U701 | 134-506-00 |
| U702 | 134-505-00 |
| U703 | 130-223-00 |
| U704 | 134-013-00 |
| U705 | 134-504-00 |
| U706 | 134-507-00 |
| LED | |
| CR775 | 102-026-00 |
| METER | |
| M775 | S171-232 |
| RESISTORS | |
| R702 | 111-056 |
| R703, R709 | S118-407-02 |
| R705, R711 | 113-187 |
| R706 | 112-980 |
| R707 | 112-979 |
| R708, R713, R733, R736 | 112-949-00 |
| R710 | 118-253-00 |
| R712 | 111-050 |
| R714 | 111-004 |
| R715, R722, R739, R740 | 112-930 |

| MODEL UIC (Cont.) | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-765-00 | |
| DRAWING No. 863-617 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| R716 | 112-935 |
| R717, R729 | 112-968 |
| R718 | 111-001 |
| R719, R734 | 112-077-00 |
| R720 | 111-035 |
| R721, R725 | 111-033 |
| R726 | 112-980 |
| R727 | 111-032 |
| R728 | 112-990 |
| R730, R735, R741, R742, R747 | 112-051-00 |
| R731 | S118-407-01 |
| R732 | 111-037 |
| R737 | 112-105 |
| R738 | 112-941-00 |
| R743 | 112-977 |
| R744, R746 | 112-936 |
| R745, R749 | 112-917 |
| R748 | 112-087-00 |
| R750 | 112-994 |
| SWITCH | |
| S775 | 162-045 |
| TRANSFORMERS | |
| T701 | B144-454-00 |
| T702 | B155-633 |
| T703 | B155-632 |
| TRANSISTORS | |
| Q701, Q704, Q706 | 130-190 |
| Q702 | S130-147 |
| Q703, Q707 | B130-168-00 |
| Q705 | 130-214-00 |

| MODEL SWITCH AND FEED THRU ASSEMBLY | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 815-321-03 | |
| DRAWING No. 863-617 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2, C3, C4, C5, C6, C7, C8, C9, C10 | 129-120 |

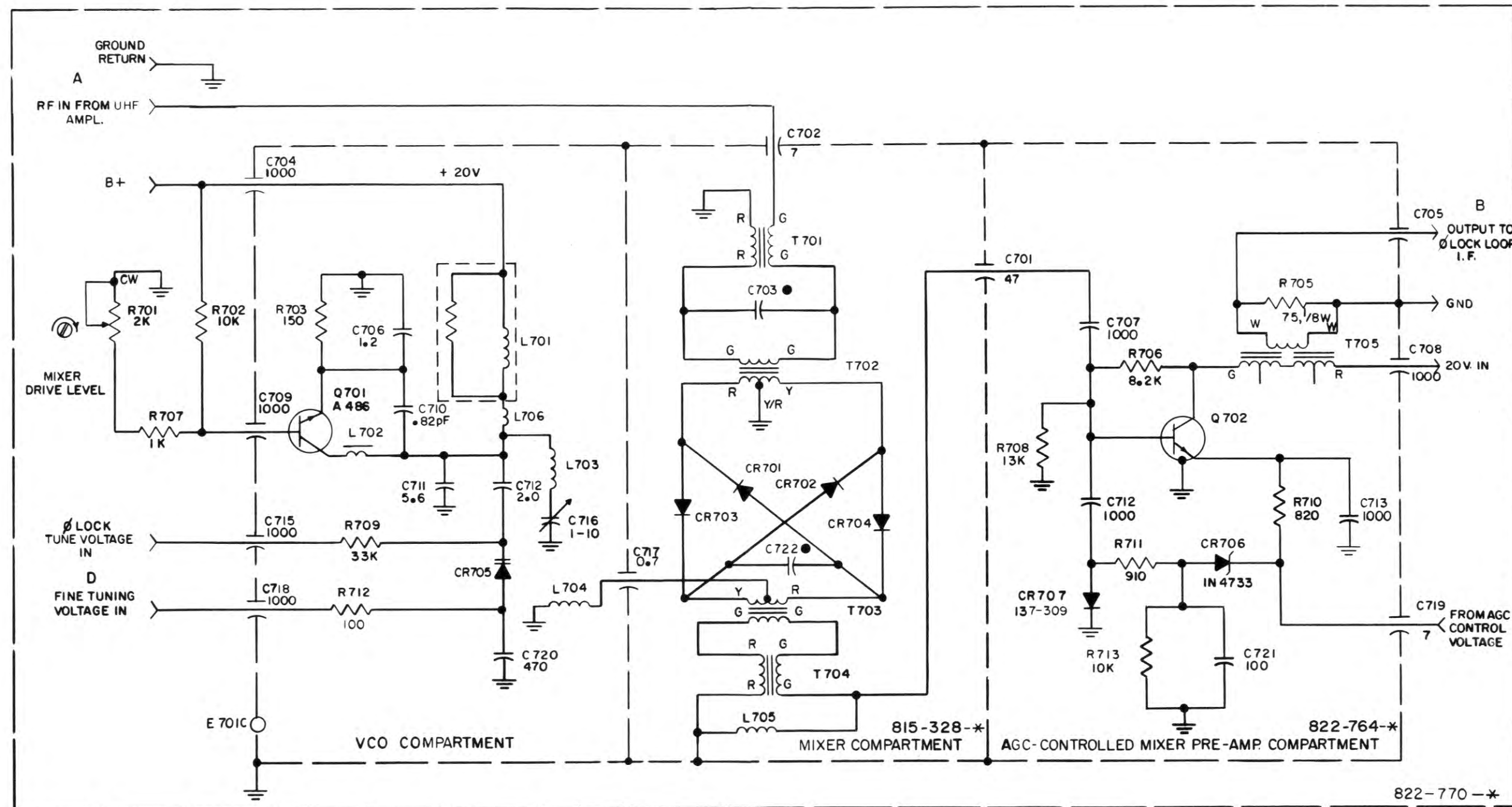


REPLACEMENT PARTS LIST

| MODEL UIC AGC CONTROLLED PRE-AMP MIXER COMP. | |
|-----------------------------------------------------------|----------------------------------------------------------------------------|
| ASSEMBLY No. 822-764 | |
| DRAWING No. 863-616 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS C707, C713, C721 C721 | 124-077 124-058 |
| DIODES CR706 CR707 | 137-805 S137-309 |
| RESISTORS R705 R706 R708 R710 R711 R713 | 111-094-00 111-110-00 111-112-00 112-976 112-920 111-111-00 |

| MODEL UIC RF DOWN CONVERTER VCO, AGC AMPLIFIER | |
|---------------------------------------------------|----------------------------------------------------------|
| ASSEMBLY No. 815-328 | |
| DRAWING No. 863-616 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| DIODES CR701, CR702, CR703, CR704 | B139-258 |
| TRANSFORMERS T701 T702 T703 T704 | B144-469-00 B144-456-00 B144-456-01 B144-469-01 |

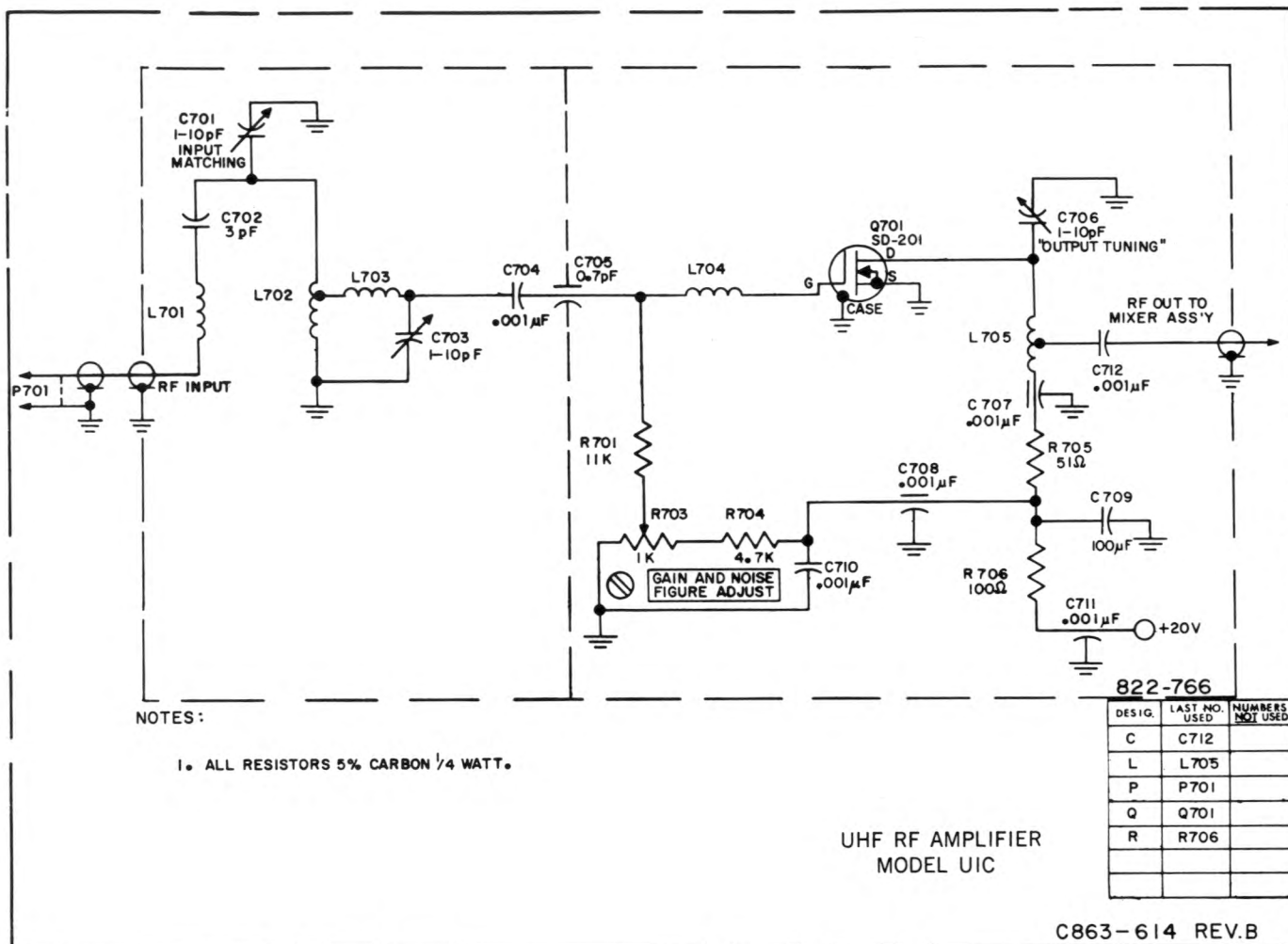
| MODEL UIC RF DOWN CONVERTER VCO, AGC AMPLIFIER | |
|--------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| ASSEMBLY No. 822-770 | |
| DRAWING No. 863-616 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS C701 C702, C705, C717, C719 C704, C709, C715, C718 C706 C708 C710 C711 C712 C716 C720 | 129-202 701-105 129-120-00 124-340-00 129-200-00 112-101 124-342-00 124-341-00 128-590-00 124-343-00 |
| DIODE CR705 | 137-307 |
| RESISTORS R701 R702 R703 R707 R709 R712 | 118-407-02 112-949 112-974 112-977 111-003 112-950 |
| TRANSISTOR Q701 | 130-251 |



- NOTES:
1. ALL RESISTORS ARE IN OHMS, 5%, 1/4W.
 2. ALL CAPACITORS ARE IN pF.
 3. CAPACITORS MARKED ● (C703 & C722), ARE COPPER RUNS ON CIRCUIT BOARD.

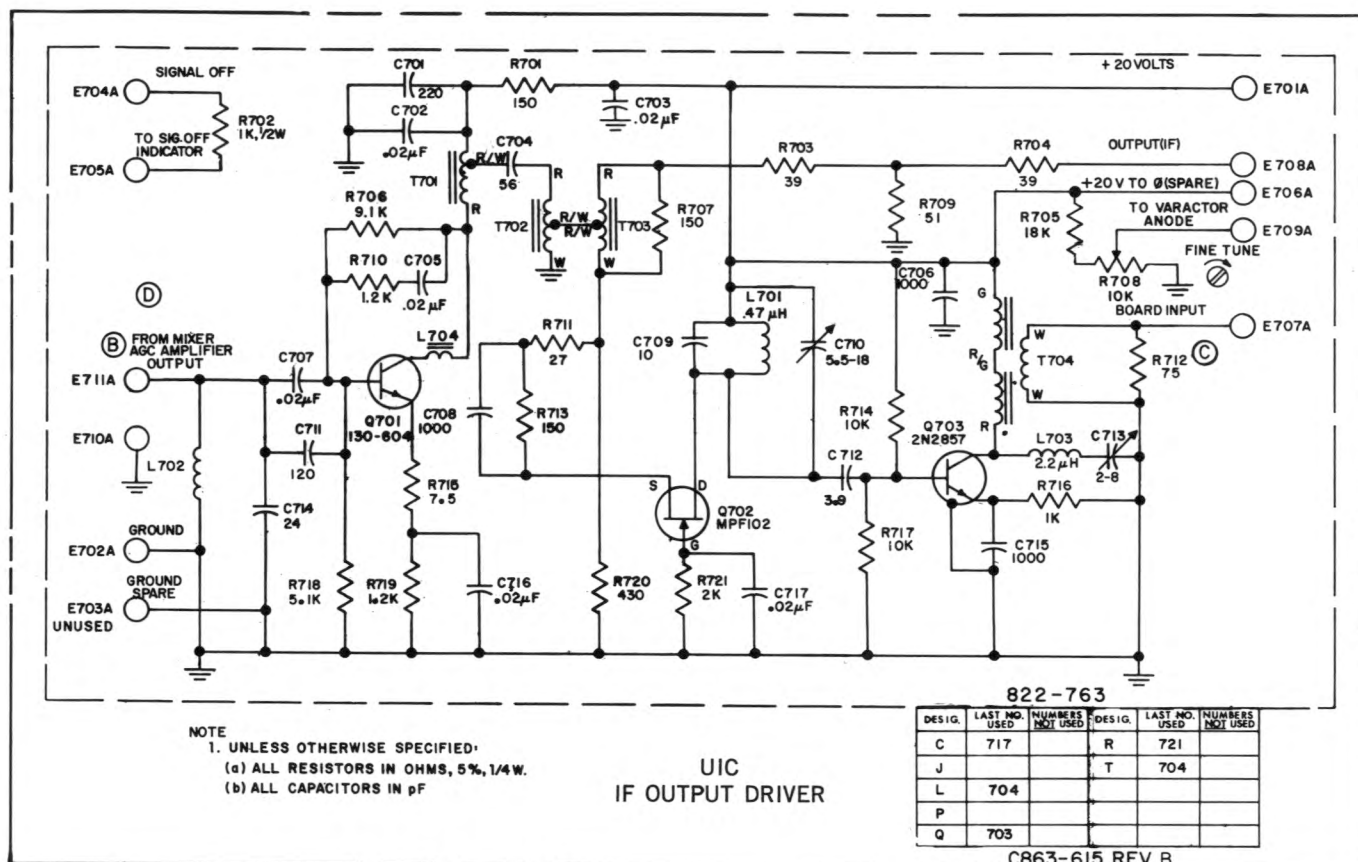
| TAB | |
|-------|-----|
| MODEL | * |
| UIC | -00 |
| UICe | -01 |

UIC
RF DOWN CONVERTER
VCO, AGC AMPL
D863-616 REV. B



REPLACEMENT PARTS LIST

| MODEL UIC, UHF, RF AMPLIFIER | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-766-00 | |
| DRAWING No. 863-614 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C701, C703, C706 | 128-590-00 |
| C702 | 122-066 |
| C704, C710, C712 | 124-077 |
| C705, C711 | 129-199 |
| C707, C708 | 129-200 |
| C709 | 127-315-15 |
| RESISTORS | |
| R701 | 112-988 |
| R703 | 118-136 |
| R704 | 111-001 |
| R705 | 112-087 |
| R706 | 112-950 |
| TRANSISTOR | |
| Q701 | 130-623-00 |



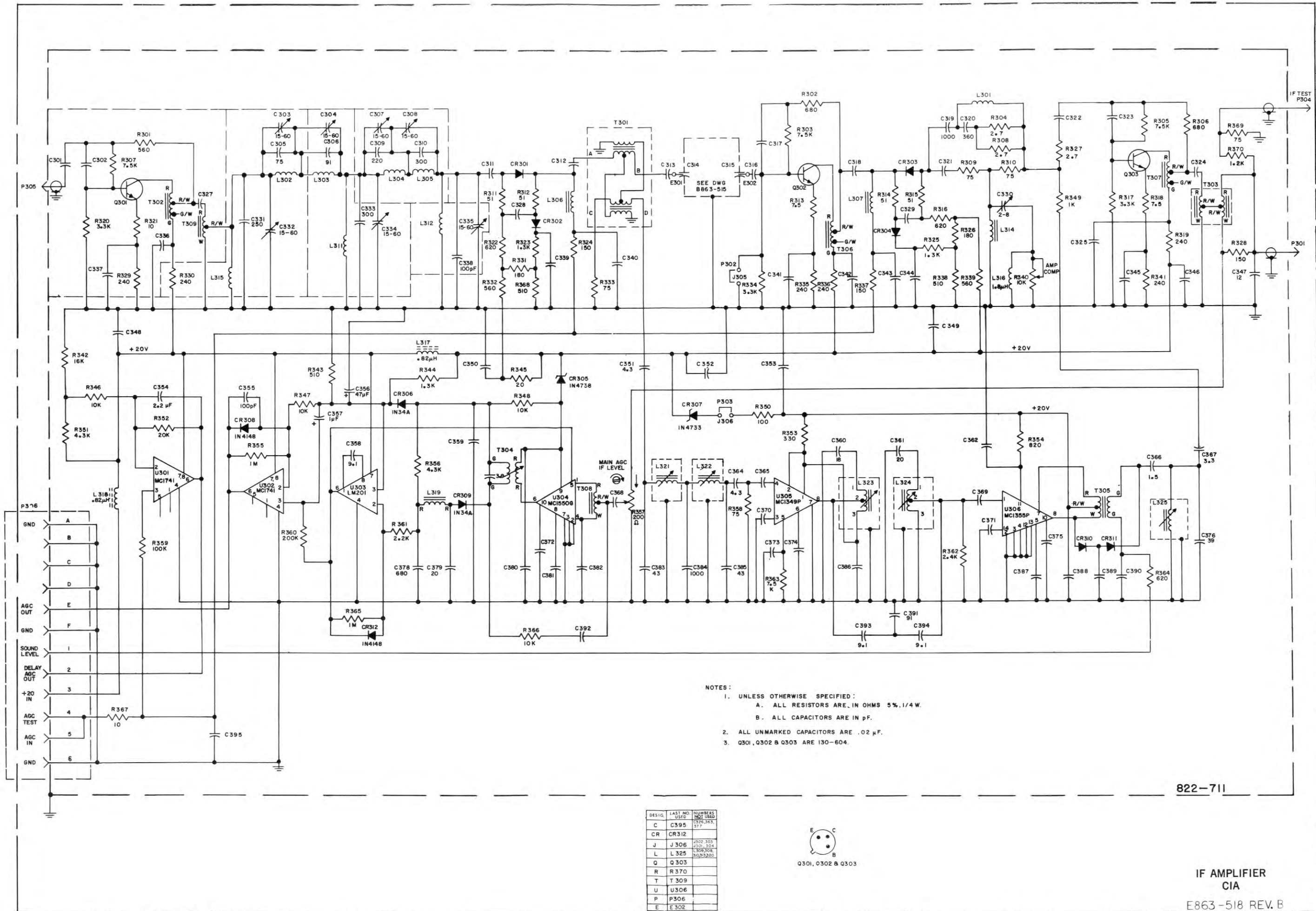
REPLACEMENT PARTS LIST

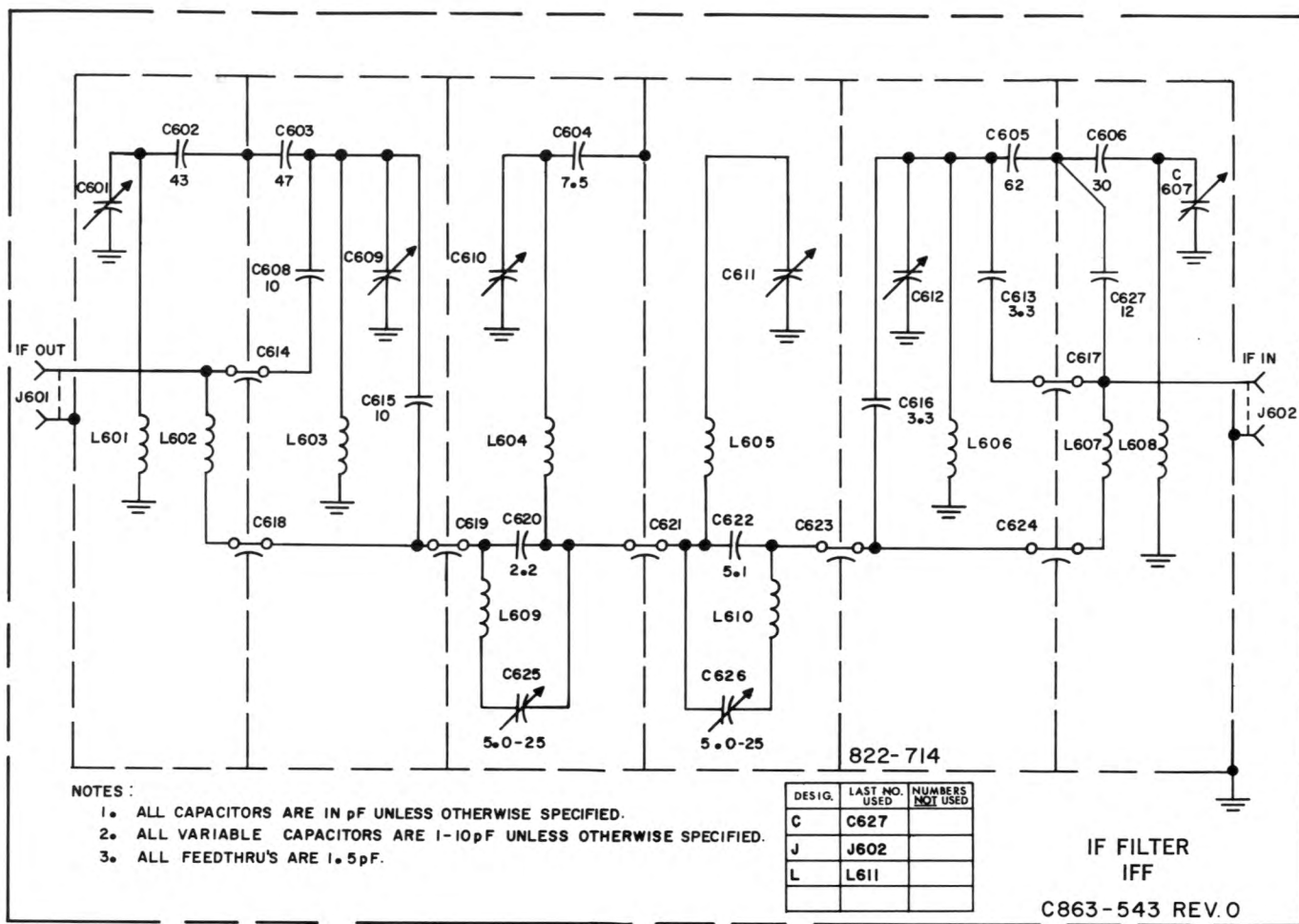
| MODEL UIC IF OUTPUT DRIVER | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-763-00 | |
| DRAWING No. 863-615 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C701 | 124-037 |
| C702, C703, C705, C707, C716, C717 | S124-078-00 |
| C704 | 126-104 |
| C706, C708, C715 | S123-115 |
| C709 | 126-188 |
| C710 | 128-568 |
| C711 | 124-053-00 |
| C712 | 124-086-00 |
| C713 | S128-546-01 |
| C714 | 126-188 |
| RESISTORS | |
| R701, R707, R713 | 112-974 |
| R702 | 112-359 |
| R703, R704 | 112-983 |
| R705 | 112-991 |
| R706 | 112-987 |
| R708 | 118-416 |

| MODEL UIC IF OUTPUT DRIVER | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-763-00 | |
| DRAWING No. 863-615 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| TRANSISTORS | |
| Q701 | 130-604 |
| Q702 | 130-214-00 |
| Q703 | 130-267 |
| TRANSFORMERS | |
| T701 | B144-461 |
| T702 | B144-458 |
| T703 | B144-461 |
| T704 | B144-733 |
| RESISTORS | |
| R709 | 112-087 |
| R710, R719 | 112-921 |
| R711 | 112-085 |
| R712 | 112-954 |
| R714, R717 | 112-949 |
| R715 | 112-074 |
| R716 | 112-977 |
| R718 | 112-980 |
| R720 | 112-100 |
| R721 | 112-930 |

REPLACEMENT PARTS LIST

| MODEL CIA | | MODEL CIA | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------|------------------|
| ASSEMBLY No. 822-711 | | ASSEMBLY No. 822-711 | |
| DRAWING No. 863-518 | | DRAWING No. 863-518 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. | SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | | U305 | 134-026-00 |
| C301, C302, C311, C312, C313, C316, C317, C318, C321, C322, C323, C324, C325, C327, C328, C329, C336, C337, C339, C340, C341, C342, C343, C344, C345, C346, C348, C349, C350, C352, C353, C359, C362, C365, C368, C369, C370, C371, C372, C373, C374, C375, C380, C381, C382, C386, C387, C388, C389, C390, C392, C395 | S124-078 | U306 | 134-027-00 |
| C303, C304, C307, C308, C332, C334, C335 | 128-224 | RESISTORS | |
| C305 | 126-100 | R301, R332, R339 | 112-104 |
| C306, C391 | 124-156 | R302, R306 | 112-105 |
| C309 | 126-122 | R303, R305, R307, R318 | 112-986 |
| C310, C333 | 126-113 | R304, R308, R327 | 112-027 |
| C319, C384 | 126-034 | R309, R310, R333, R358, R369 | 112-954 |
| C320 | 127-316 | R311, R312, R314, R315 | 112-087 |
| C330 | 128-546 | R313, R363 | 112-074 |
| C331 | 126-111 | R316, R322, R364 | 112-998 |
| C338 | 126-091 | R317, R320, R334 | 112-936 |
| C347 | 124-102-00 | R319, R329, R330, R335, R336, R341 | 112-975 |
| C351, C364 | 124-087-00 | R321, R367 | 112-077 |
| C354 | 124-373-00 | R323, R325, R344 | 112-064 |
| C355 | 124-042 | R326, R331 | 112-994 |
| C356 | 127-330-00 | R324, R328, R337 | 112-974 |
| C357 | 127-316 | R338, R343, R368 | 112-929 |
| C358, C393, C394 | 124-108-00 | R340 | 118-407-06 |
| C361, C379 | 124-119-00 | R342 | 112-933 |
| C366 | 124-157-00 | R345 | 112-083 |
| C367 | 124-113-00 | R346, R347, R348, R366 | 112-949 |
| C376 | 124-126-00 | R349 | 112-977 |
| C378 | 126-081 | R350 | 112-950 |
| C383, C385 | 126-101 | R351, R356 | 111-006 |
| DIODES | | R352 | 111-033 |
| CR301, CR302, CR303, CR304, CR310, CR311 | S137-309 | R353 | 112-097 |
| CR305 | 137-808 | R354 | 112-976 |
| CR306, CR309 | 139-261 | R355, R365 | 111-041 |
| CR307 | 137-805 | R357 | 118-408 |
| CR308, CR312 | 137-824 | R359 | 112-935 |
| INTEGRATED CIRCUITS | | R360 | 111-035 |
| U301, U302 | 134-506-00 | R361 | 112-932 |
| U303 | 134-514-00 | R362 | 112-918 |
| U304 | 130-223 | R370 | 112-921 |
| | | TRANSFORMERS | |
| | | T301 | C144-467 |
| | | T302, T306, T307 | B144-738-00 |
| | | T303 | C144-740-00 |
| | | T304 | B155-622-00 |
| | | T305 | B144-736-00 |
| | | T308 | B144-737-00 |
| | | T309 | B144-741-00 |
| | | TRANSISTORS | |
| | | Q301, Q302, Q303 | 130-604 |



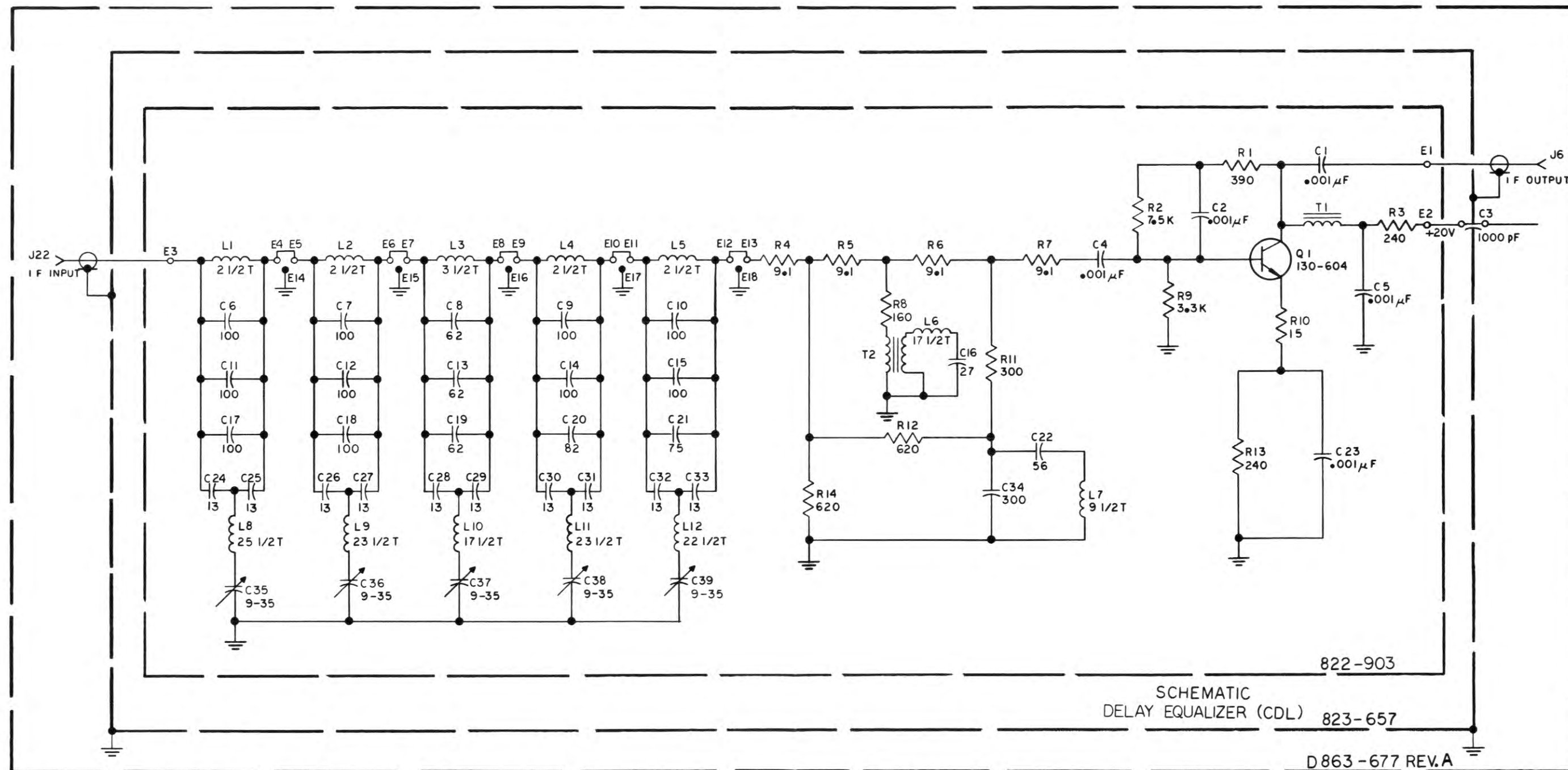


REPLACEMENT PARTS LIST

| MODEL IF FILTER | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-714-00 | |
| DRAWING No. 863-543 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C601, C607, C609, C610, C611, C612 | 128-590 |
| C602 | 126-101 |
| C603 | 124-122 |
| C604 | 124-072 |
| C605 | 126-107 |
| C606 | 124-121 |
| C608, C615 | 124-137 |
| C613, C616 | 124-113 |
| C614, C617, C618, C619, C621, 623, 624 | 129-204 |
| C620 | 124-084 |
| C622 | 124-127 |
| C625, C626 | 128-239 |
| C627 | 124-102 |

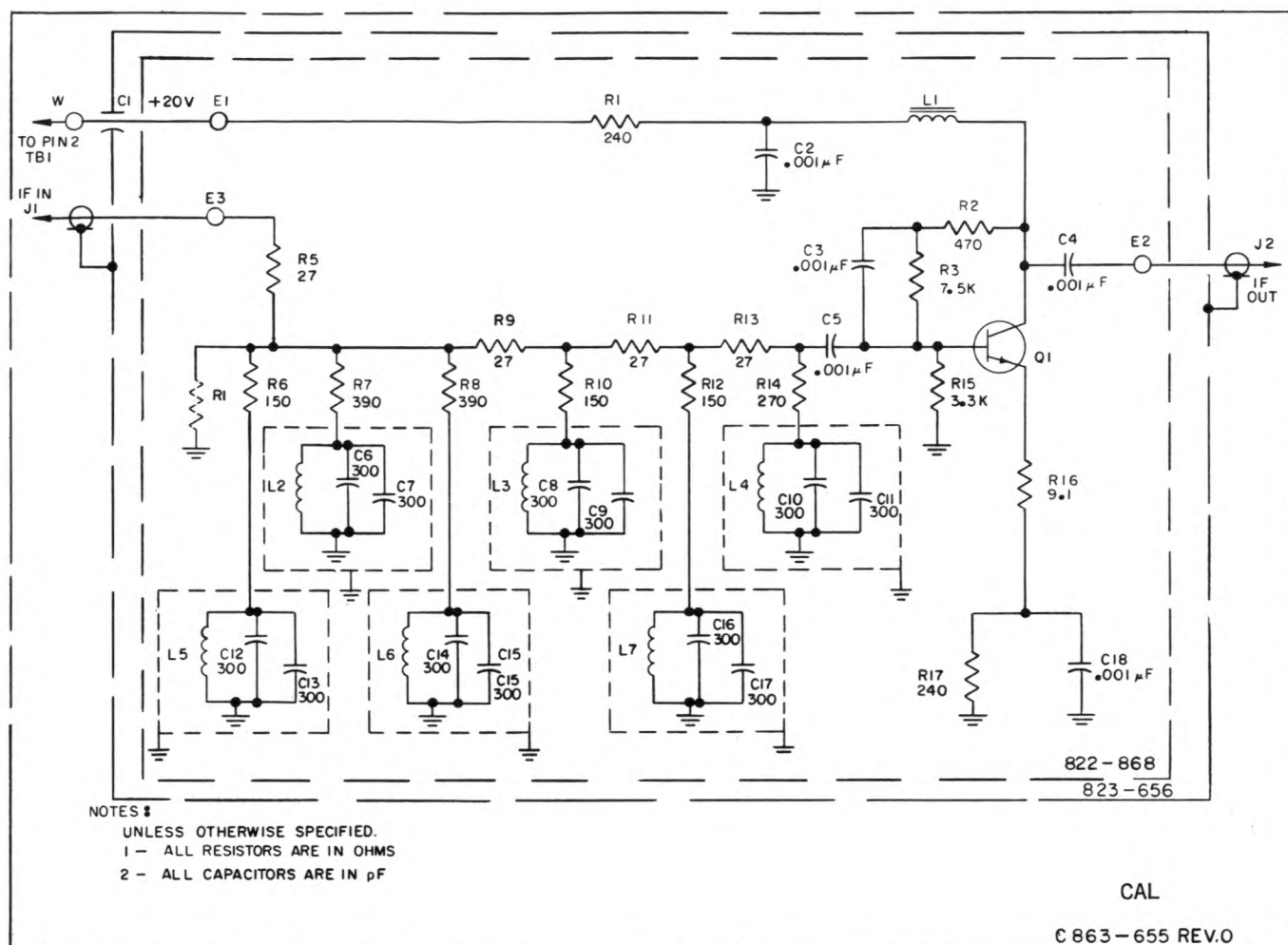
REPLACEMENT PARTS LIST

| MODEL CDL | |
|-----------------------------------------------------|---------------------|
| ASSEMBLY No. 822-903 | |
| DRAWING No. 863-677 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2, C4, C5, C23 | 124-049 |
| C3 | 129-200-00 |
| C6, C7, C9, C10, C11, C12, C14, C15, C17, C18 | S126-230-73 |
| C8, C13, C19 | S126-230-35 |
| C20 | S126-230-55 |
| C21 | S126-230-48 |
| C22 | 126-104 |
| C24, C25, C26, C27, C28, C29, C30, C31, C32, C33 | 126-229-02 |
| C34 | 126-113 |
| C35, C36, C37, C38, C39 | 128-565 |
| RESISTORS | |
| R1 | 112-099 |
| R2 | 112-986 |
| R3, R13 | 112-975 |
| R4, R5, R6, R7 | 112-076 |
| R8 | 112-094 |
| R9 | 112-936 |
| R10 | 112-973 |
| R11 | 112-096 |
| R12, R14 | 112-998 |
| TRANSFORMERS | |
| T1 | B144-774 |
| T2 | B144-777 |
| TRANSISTORS | |
| Q1 | 130-604 |



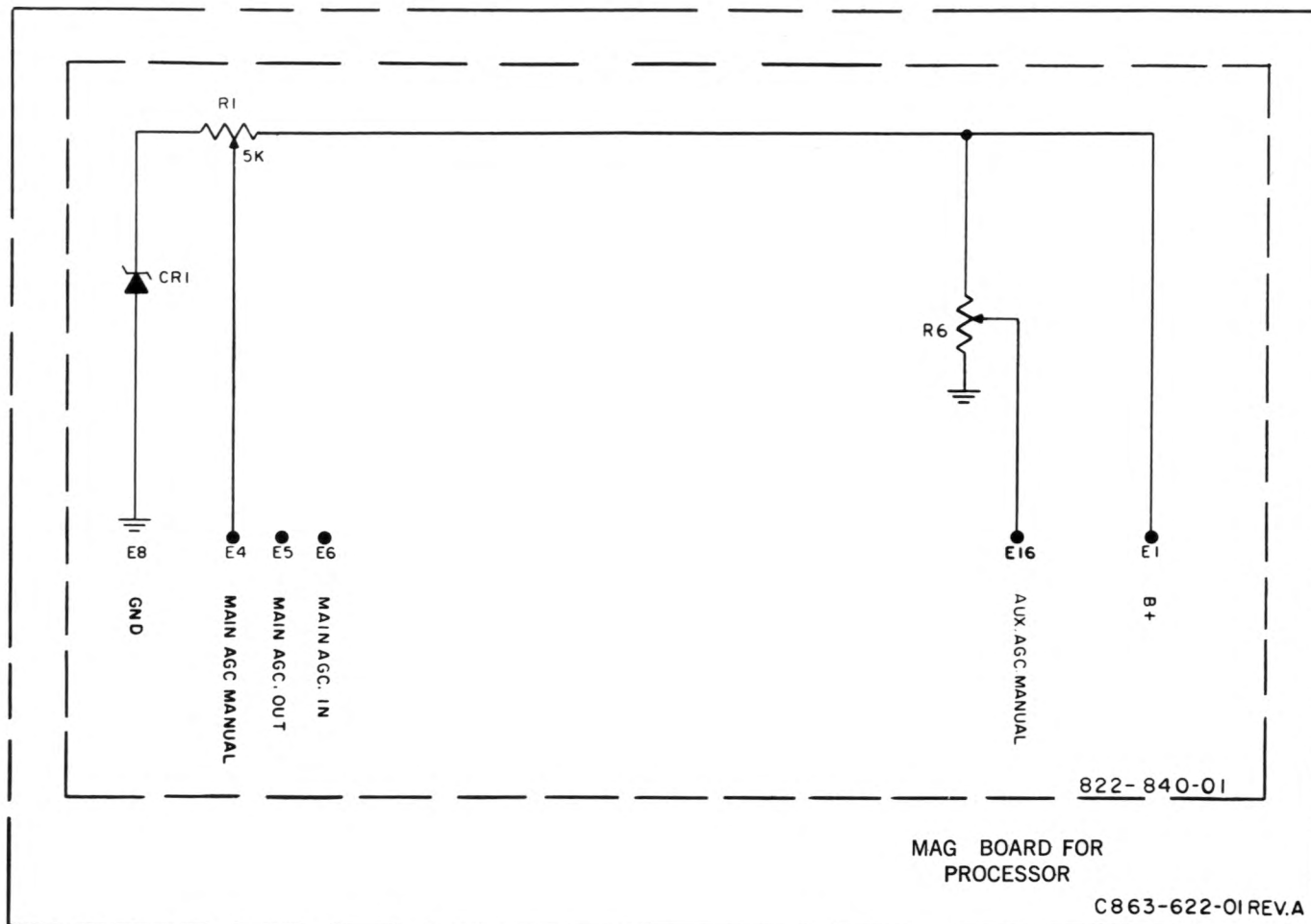
NOTES:
UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTORS ARE IN OHMS.
2. ALL CAPACITORS ARE IN pF.
3. ALL INDUCTORS ARE IN μH.

| DESIG. | LAST NO. USED | NUMBERS NOT USED |
|--------|------------------|---------------------|
| C | C39 | |
| E | E18 | |
| J | J22 | J106 J107 |
| L | L12 | |
| Q | Q1 | |
| R | R14 | |
| T | T2 | |



REPLACEMENT PARTS LIST

| MODEL CAL | |
|-----------------------------------------------------------|---------------------|
| ASSEMBLY No. 822-868 | |
| DRAWING No. 863-655 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C2, C3, C4, C5, C18 | 124-049 |
| C6, C7, C8, C9, C10, C11, C12, C13, C14, C15, C16, C17 | 126-113 |
| RESISTORS | |
| R1, R17 | 112-975 |
| R2 | 112-101 |
| R3 | 112-986 |
| R5, R9, R11, R13 | 112-085 |
| R6, R10, R12 | 112-974 |
| R7, R8 | 112-099 |
| R14 | 112-993 |
| R15 | 112-936 |
| R16 | 112-073 |
| TRANSISTOR | |
| Q1 | 130-604 |

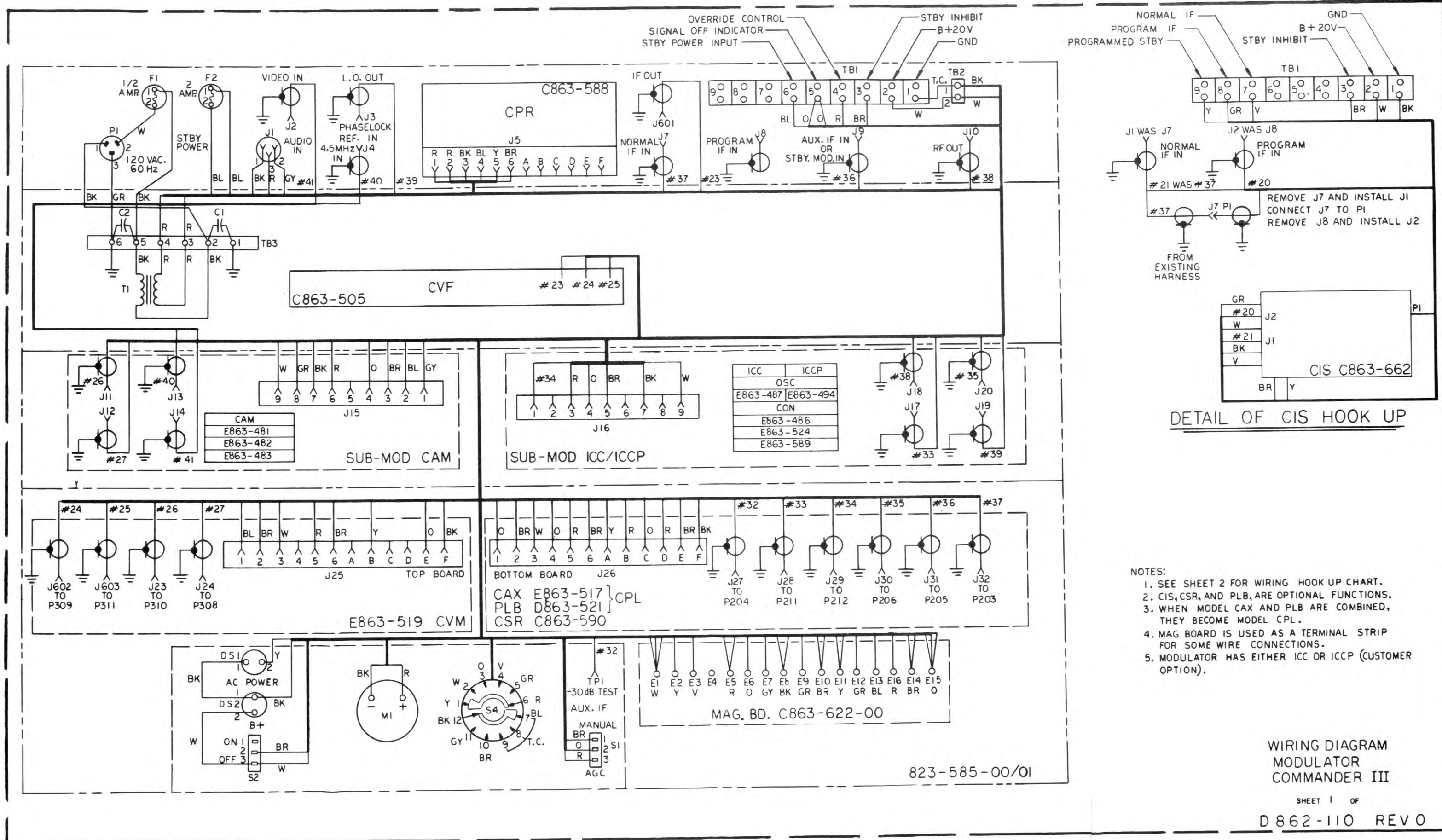


REPLACEMENT PARTS LIST

| MAG BOARD FOR PROCESSOR | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-840-01 | |
| DRAWING No. 863-622—Sheet 2 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| DIODE CR1 | 137-806 |
| RESISTORS R1, R6 | 118-254-00 |

REPLACEMENT PARTS LIST

| MODEL MMF | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 812-407 | |
| DRAWING No. 862-110 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2 | 124-032 |
| FUSES | |
| F1 | 101-335 |
| F2 | 101-352 |
| FUSE HOLDERS | |
| F1, F2 | 101-811 |
| LAMPS | |
| DS1 (Amber) | 102-302 |
| DS2 (Green) | 102-303 |
| METER | |
| M1 | C171-234-01 |
| SWITCHES | |
| S1, S2 | 162-045 |
| S4 | C161-163 |
| TRANSFORMER | |
| T1 | C141-309-00 |



| FROM | TO | REMARKS |
|---------------|------------------------------|--------------------------|
| P1 PIN 1 | TB3 TERM 2 | BK LINE CORD |
| P1 PIN 2 | F1 TERM 2 | W LINE CORD |
| P1 PIN 3 | TB3 TERM 6 | GR LINE CORD |
| F1 TERM 1 | TB3 TERM 5 | BK #22 WIRE |
| F2 TERM 1 | J5 PIN 4 OR TB1 PIN 6 | BL #22 WIRE |
| F2 TERM 2 | | BL #22 WIRE |
| TB3 TERM 1 | TB3 TERM 2 | C1, .01 μ F, 1000VDC |
| TB3 TERM 2 | T1 PRIMARY | BK #22 WIRE |
| TB3 TERM 3 | T1 SECONDARY | R #22 WIRE |
| TB3 TERM 3 | J5 TERM 1 OR J5 TERM 2 | R #22 WIRE |
| TB3 TERM 4 | | R #22 WIRE |
| TB3 TERM 4 | T1 SECONDARY | R #22 WIRE |
| TB3 TERM 5 | TB3 TERM 6 | C2, .01 μ F, 1000VDC |
| TB3 TERM 5 | T1 PRIMARY | BK #22 WIRE |
| | | |
| J1 PIN 1 | TB2 TERM 1 | BK #22 WIRE |
| J1 PIN 2 | J15 PIN 1 | GY #22 WIRE |
| J1 PIN 3 | J15 PIN 6 | R #22 WIRE |
| J2 | J14 | COAXIAL #41 |
| J3 | J19 | COAXIAL #39 |
| J4 | J13 | COAXIAL #40 |
| J5 PIN 3 | TB2 TERM 1 | BK #22 WIRE |
| J5 PIN 5 | DS1 PIN 2 | Y #22 WIRE |
| J5 PIN 6 | S2 TERM 2 | BR #22 WIRE |
| J5 PIN A TO F | NOT CONNECTED | |
| J601 | CVF BOX | COAXIAL #23 |
| J7 | J32 | COAXIAL #37 |
| J8 | NOT CONNECTED | |
| J9 | J31 | COAXIAL #36 |
| J10 | J18 | COAXIAL #38 |
| | | |
| TB1 TERM 1 | TB2 TERM 1 | #22 T.C. |

SEE NOTE 1

| FROM | TO | REMARKS |
|-------------------|---------------|-------------|
| TB1 TERM 2 | TB2 PIN 2 | W #22 WIRE |
| TB1 TERM 3 | J26 PIN 6 | BR #22 WIRE |
| TB1 TERM 4 | J26 PIN D | R #22 WIRE |
| TB1 TERM 5 | J26 PIN C | O #22 WIRE |
| TB1 TERM 5 | J15 PIN 4 | O #22 WIRE |
| TB1 TERM 7, 8 & 9 | NOT CONNECTED | |
| TB2 TERM 1 | J15 PIN 7 | BK #22 WIRE |
| TB2 TERM 1 | J16 PIN 7 | BK #22 WIRE |
| TB2 TERM 1 | J25 PIN F | BK #22 WIRE |
| TB2 TERM 1 | J26 PIN F | BK #22 WIRE |
| TB2 TERM 1 | E8 | BK #22 WIRE |
| TB2 TERM 2 | J15 PIN 9 | W #22 WIRE |
| TB2 TERM 2 | J16 PIN 9 | W #22 WIRE |
| TB2 TERM 2 | J25 PIN 3 | W #22 WIRE |
| TB2 TERM 2 | J26 PIN 3 | W #22 WIRE |
| TB2 TERM 2 | E1 | W #22 WIRE |
| | | |
| J11 | J23 | COAXIAL #26 |
| J12 | J24 | COAXIAL #27 |
| J15 PIN 1 | J1 PIN 2 | GY #22 WIRE |
| J15 PIN 2 | J25 PIN 1 | BL #22 WIRE |
| J15 PIN 3 | J25 PIN 2 | BR #22 WIRE |
| J15 PIN 5 | NOT CONNECTED | |
| J15 PIN 8 | E12 | GR #22 WIRE |
| | | |
| J16 PIN 1 | J29 | COAXIAL #34 |
| J16 PIN 2, 6 & 8 | NOT CONNECTED | |
| J16 PIN 3 | J26 PIN B | R #22 WIRE |
| J16 PIN 4 | J26 PIN 1 | O #22 WIRE |
| J16 PIN 5 | J26 PIN 2 | BR #22 WIRE |
| J17 | J28 | COAXIAL #33 |
| J20 | J30 | COAXIAL #35 |

| FROM | TO | REMARKS |
|------------------------------|---------------|-------------|
| J602 | CVF BOX | COAXIAL #24 |
| J603 | CVF BOX | COAXIAL #25 |
| J25 PIN 4, A, C & D | NOT CONNECTED | |
| J25 PIN 5 | E5 | R #22 WIRE |
| J25 PIN 6 | E10 | BR #22 WIRE |
| J25 PIN B | E2 | Y #22 WIRE |
| J25 PIN E | E6 | O #22 WIRE |
| J26 PIN 4 | E15 | O #22 WIRE |
| J26 PIN 5 | E5 | R #22 WIRE |
| J26 PIN A | E11 | Y #22 WIRE |
| J26 PIN E | E14 | BR #22 WIRE |
| J27 | TP1 | COAXIAL #32 |
| DS1 PIN 1 | DS2 PIN 1 | BK #22 WIRE |
| DS2 PIN 1 | E8 | BK #22 WIRE |
| DS2 PIN 2 | S2 PIN 3 | W #22 WIRE |
| S1 TERM 1 | E14 | BR #22 WIRE |
| S1 TERM 2 | E15 | O #22 WIRE |
| S1 TERM 3 | E16 | R #22 WIRE |
| S2 TERM 1 | NOT CONNECTED | |
| S2 TERM 3 | E1 | W #22 WIRE |
| S4 TERM 1 - ϕ LOCK | E11 | Y #22 WIRE |
| S4 TERM 2 - B+ | E1 | W #22 WIRE |
| S4 TERM 3 - AGC | E15 | O #22 WIRE |
| S4 TERM 4 - VIDEO | E3 | V #22 WIRE |
| S4 TERM 5 - AUDIO | E9 | GR #22 WIRE |
| S4 TERM 6 - + | M1 + | R #22 WIRE |
| S4 TERM 7 - ϕ LOCK - B+ | E13 | BL #22 WIRE |
| S4 TERM 8 & 9 - AGC | S4 TERM 7 | #22 T.C. |
| S4 TERM 10 - VIDEO | E10 | BR #22 WIRE |
| S4 TERM 11 - AUDIO | E7 | GY #22 WIRE |
| S4 TERM 12 - - | M1 - | BK #22 WIRE |
| E4 | NOT CONNECTED | |

NOTE :

1. COAXIAL IDENTIFICATION NUMBER IS EQUIVALENT TO TAB NUMBER OF CABLE ASSEMBLY DRAWING D811-878 (EXAMPLE : #37 = 811-878-37).

WIRING DIAGRAM
MODULATOR
COMMANDER III

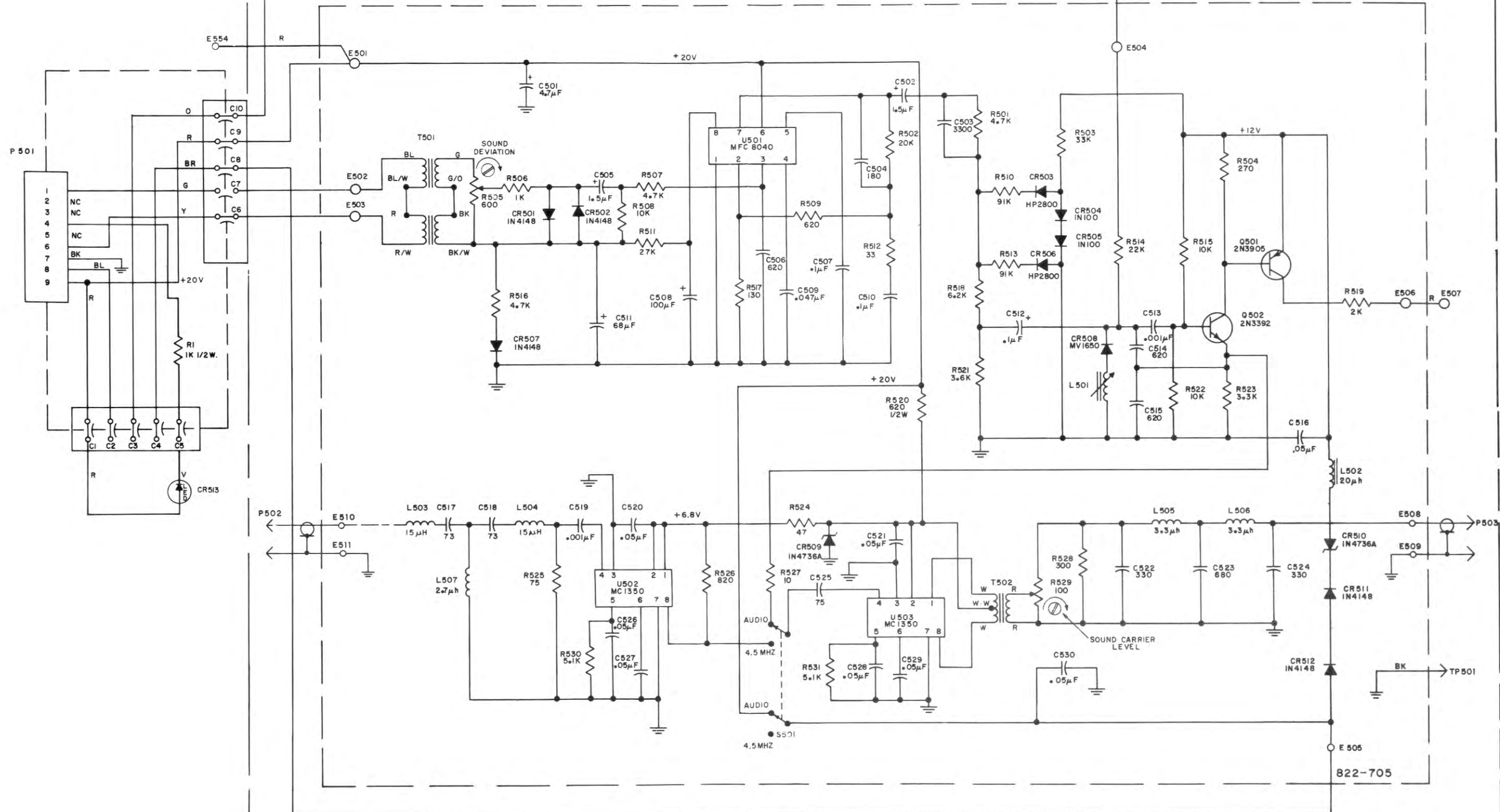
862-110
SHEET 2 OF

REPLACEMENT PARTS LIST

| MODEL AUDIO MOD. (VCO) | |
|------------------------------------------------|------------------|
| ASSEMBLY No. 822-705-00 | |
| DRAWING No. 863-483 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C501 | 127-079 |
| C502, C505 | 127-323 |
| C503 | 124-181 |
| C504 | 124-085 |
| C506 | 124-146 |
| C507 | 125-301 |
| C508 | 127-060 |
| C509 | 125-326 |
| C510 | 125-337 |
| C511 | 127-319 |
| C512 | 127-316 |
| C513, C519 | 126-169 |
| C514, C515 | 126-114 |
| C516, C520, C521, C526, C527, C528, C529, C530 | S126-230-46 |
| C517, C518 | 126-081 |
| C522, C524 | 124-052 |
| C523 | |
| C525 | |
| DIODES | |
| CR501, CR502, CR507, CR511, CR512 | 137-824 |
| CR503, CR506 | 137-832 |
| CR504, CR505 | 137-800 |
| CR508 | 139-268 |
| CR509, CR510 | 137-807 |
| INTEGRATED CIRCUITS | |
| U501 | 134-030-00 |
| U502, U503 | 134-013-00 |
| RESISTORS | |
| R501, R507, R516 | 111-001 |
| R502 | 111-033 |
| R503 | 111-003 |
| R504 | 112-993 |
| R505 | S118-250-00 |
| R506 | 112-977 |
| R508, R515, R522 | 112-949 |
| R509 | 112-998 |
| R510, R513 | 111-074 |
| R511 | 111-031 |

| MODEL AUDIO MOD. (VCO) | |
|---------------------------------------------|------------------|
| ASSEMBLY No. 822-705-00 | |
| DRAWING No. 863-483 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| R512 | 112-995 |
| R514 | 111-015 |
| R517 | 112-997 |
| R518 | 112-981 |
| R519 | 112-930 |
| R520 | 112-335 |
| R521 | 112-999 |
| R523 | 112-936 |
| R524 | 112-992 |
| R525 | 112-954 |
| R526 | 112-976 |
| R527 | 112-077 |
| R528 | 112-096 |
| R529 | S118-251-00 |
| R530, R531 | 112-980 |
| SWITCH | |
| S501 | 162-037 |
| TRANSFORMERS | |
| T501 | 141-213 |
| T502 | B144-739 |
| TRANSISTORS | |
| Q501 | B130-168 |
| Q502 | 130-166 |

| MODEL AUDIO MODULATOR | |
|---------------------------------------------|------------------|
| ASSEMBLY No. 823-528-00 | |
| DRAWING No. 863-483 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2, C3, C4, C5, C6, C7, C8, C9, C10 | 129-120 |
| LED | |
| CR513 | 102-026-00 |



| DESIG. | LAST NO. USED | NUMBERS NOT USED | DESIG. | LAST NO. USED | NUMBERS NOT USED |
|--------|---------------|------------------|--------|---------------|------------------|
| C | C530 | | T | T502 | |
| CR | CR513 | | U | U503 | |
| E | E511 | | | | |
| | | | P | P503 | |
| L | L507 | | S | S501 | |
| Q | Q502 | | TP | TP501 | |
| R | R531 | | | | |

NOTES
UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTORS ARE IN OHMS, 5%, 1/4 W.
2. ALL CAPACITORS ARE IN pF.



AUDIO MOD.
VCO

863-483 REV. A

REPLACEMENT PARTS LIST

FREQUENCY CONTROL

ASSEMBLY No. 822-706-00

DRAWING No. 863-482

SCHEMATIC DESIGNATIONS
OR PART DESCRIPTIONS

JERROLD
PART No.

CAPACITORS

| | |
|------------------|---------|
| C551 | 124-150 |
| C552 | 126-179 |
| C553 | 124-126 |
| C554, C555 | 127-320 |
| C556 | 127-313 |
| C557, C569, C573 | 125-324 |
| C558 | 124-179 |
| C559, C565, C568 | 127-079 |
| C560, C572 | 127-316 |
| C561 | 128-563 |
| C562, C563, C571 | 126-214 |
| C564 | 125-326 |
| C566, C567 | 126-081 |
| C570 | 124-066 |

CRYSTAL

| | |
|------|-------------|
| Y551 | S139-283-00 |
|------|-------------|

DIODES

| | |
|-----------------------------------------------|--------------------|
| CR551, CR552, CR554, CR555, CR556 CR553 | 137-824 137-804 |
|-----------------------------------------------|--------------------|

INTEGRATED CIRCUITS

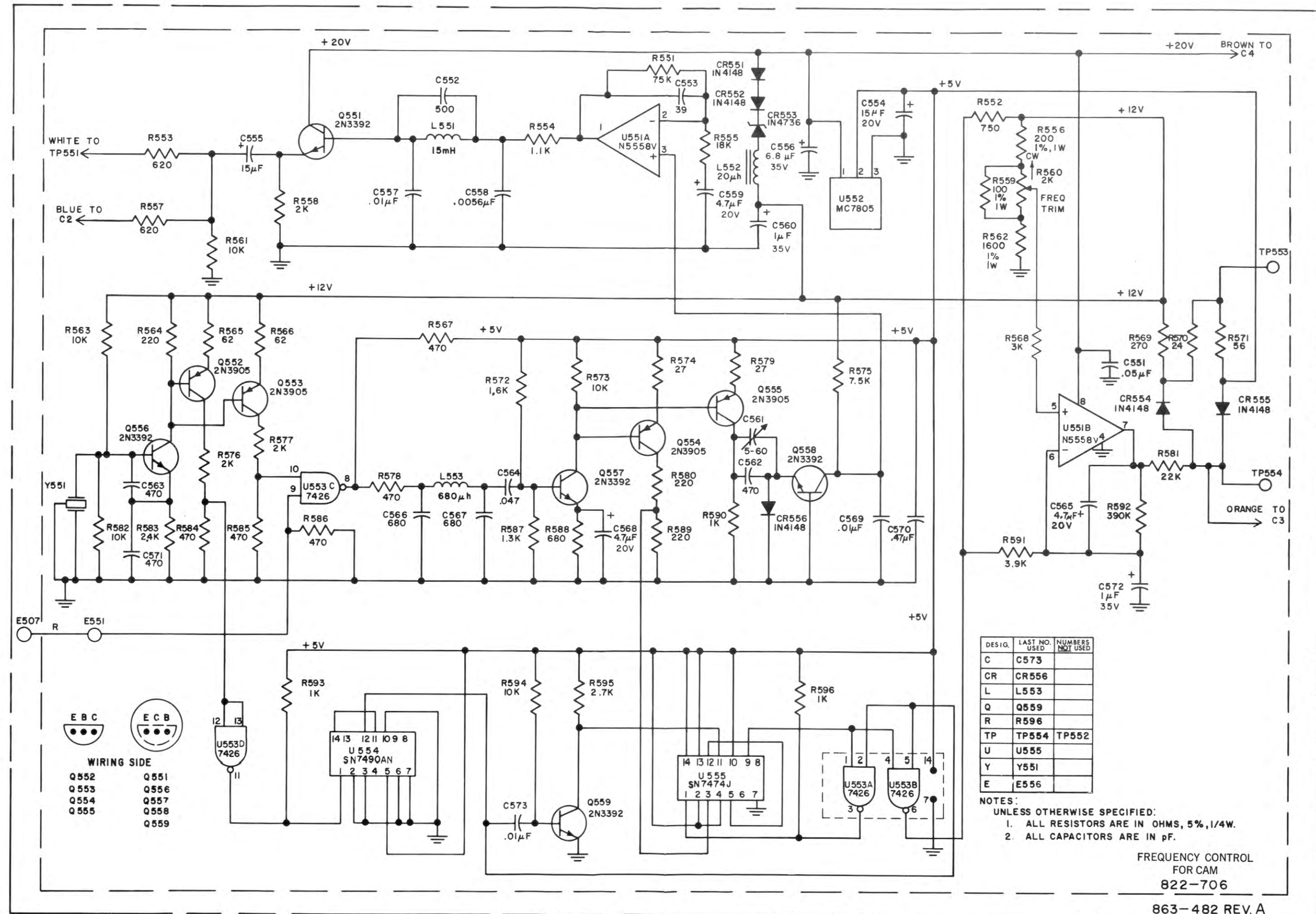
| | |
|------|------------|
| U551 | 134-012-00 |
| U552 | 134-032-00 |
| U553 | 134-031-00 |
| U554 | 134-033-00 |
| U555 | 134-034-00 |

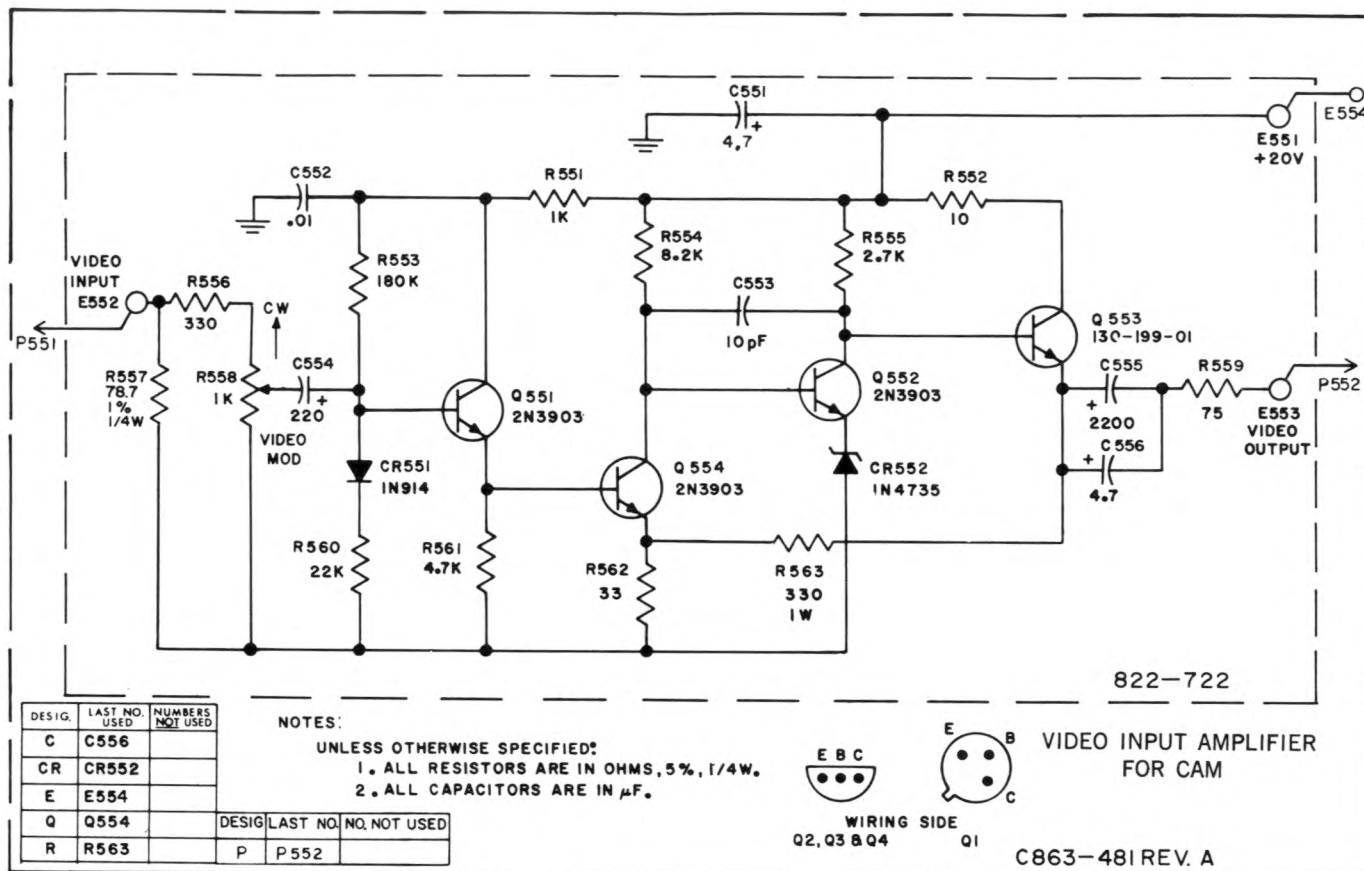
RESISTORS

| | |
|------------------------------|------------|
| R551 | 111-034 |
| R552 | 112-917 |
| R553, R557 | 112-998 |
| R554 | 112-927 |
| R555 | 112-991 |
| R556 | 113-224-00 |
| R558, R576, R577 | 112-930 |
| R559 | 113-222-00 |
| R560 | 118-407-02 |
| R561, R563, R573, R582, R594 | 112-949 |
| R562 | 113-223-00 |
| R564, R580, R589 | 112-095 |
| R565, R566 | 112-089 |
| R567, R578, R584, R585, R586 | 112-101 |
| R568 | 112-934 |
| R569 | 112-993 |
| R570 | 112-985 |
| R571 | 112-088 |
| R572 | 111-012 |
| R574, R579 | 112-085 |
| R575 | 112-986 |
| R581 | 111-015 |
| R583 | 112-918 |
| R587 | 112-064 |
| R588 | 112-105 |
| R590, R593, R596 | 112-977 |
| R591 | 112-979 |
| R592 | 111-732 |
| R595 | 112-931 |

TRANSISTORS

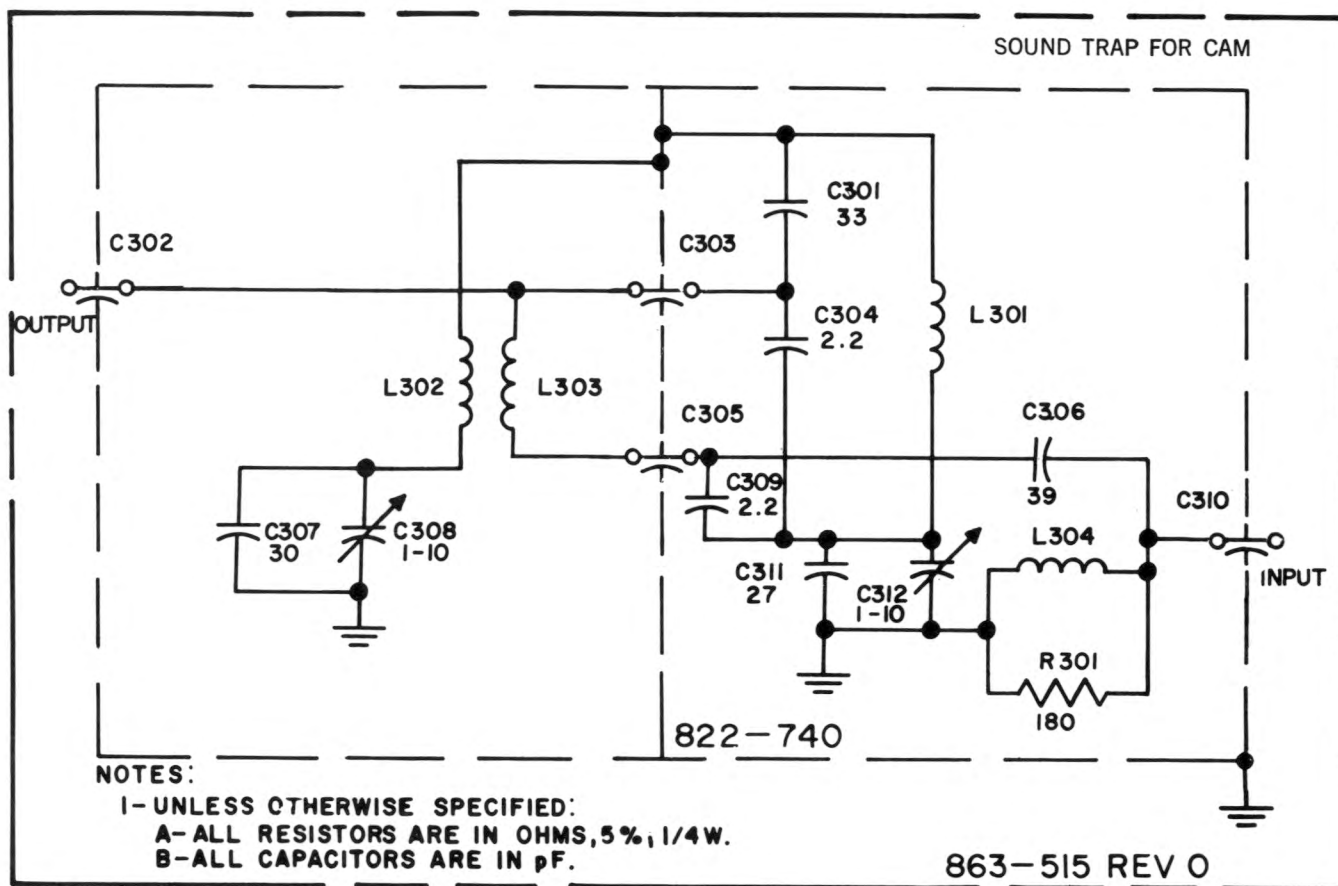
| | |
|------------------------------|----------|
| Q551, Q556, Q557, Q558, Q559 | 130-166 |
| Q552, Q553, Q554, Q555 | B130-168 |





REPLACEMENT PARTS LIST

| VIDEO INPUT AMPLIFIER FOR CAM | |
|---------------------------------------------|------------------|
| ASSEMBLY No. 822-722 | |
| DRAWING No. 863-481 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C551, C556 | 127-079 |
| C552 | 124-076 |
| C553 | 126-170 |
| C554 | 127-062 |
| C555 | 127-188 |
| DIODES | |
| CR551 | 139-169 |
| CR552 | 137-806 |
| RESISTORS | |
| R551 | 112-977 |
| R552 | 112-077 |
| R553 | 111-036 |
| R554 | 111-002 |
| R555 | 112-931 |
| R556 | 112-097 |
| R557 | 115-326 |
| R558 | S118-249-00 |
| R559 | 112-954 |
| R560 | 111-015 |
| R561 | 111-001 |
| R562 | 112-995 |
| R563 | 112-297 |
| TRANSISTORS | |
| Q551, Q552, Q554 | B130-187 |
| Q553 | S130-199-01 |

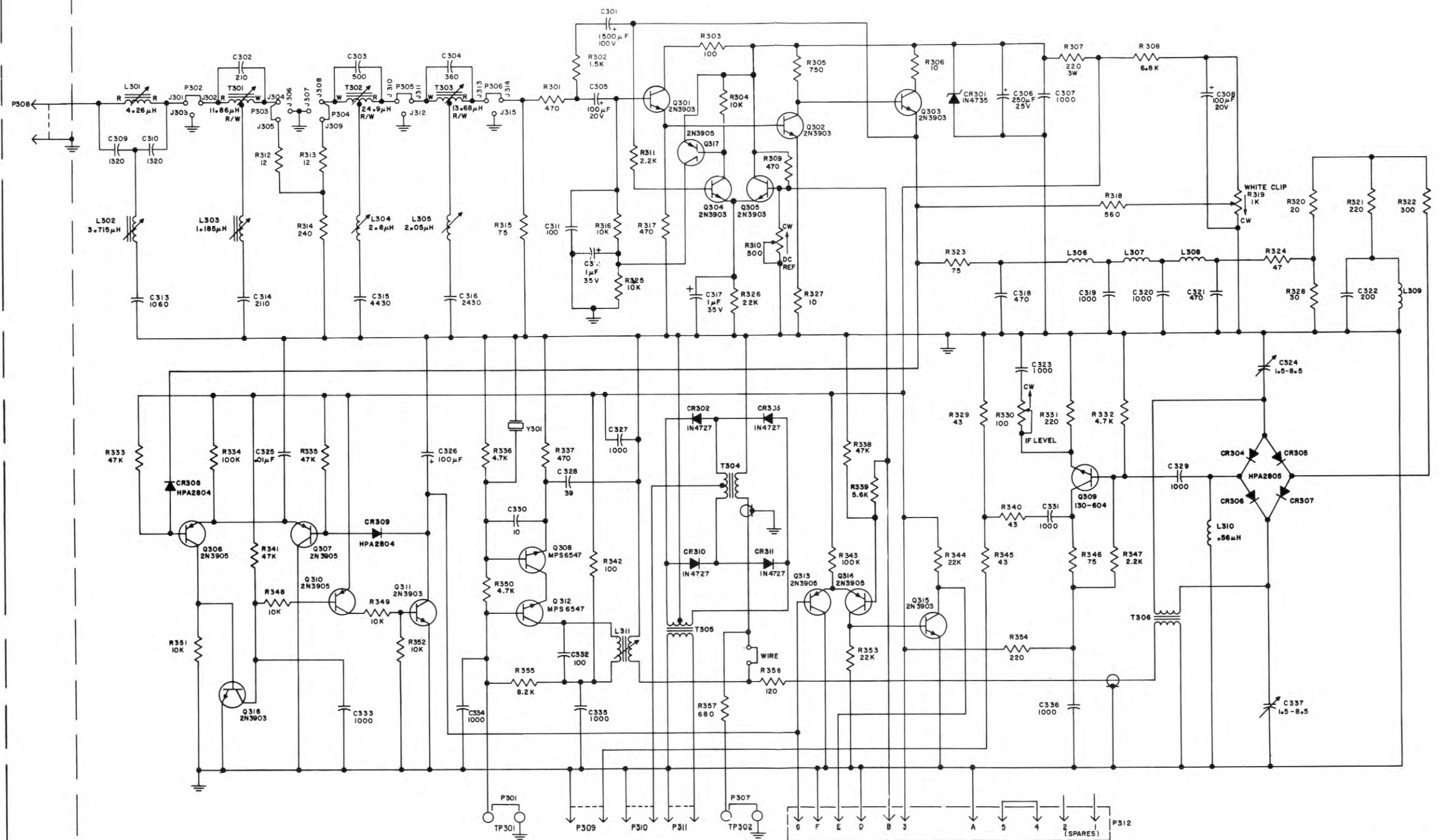


REPLACEMENT PARTS LIST

| SOUND TRAP BOX | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-740-00 | |
| DRAWING No. 863-515 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C301 | 124-125-00 |
| C302, C310 | 129-203 |
| C303, C305 | 129-204 |
| C304, C309 | 124-064-00 |
| C306 | 124-126-00 |
| C307 | 124-121-00 |
| C308, C312 | 128-590 |
| C311 | 124-120-00 |
| RESISTOR | |
| R301 | 112-994 |

REPLACEMENT PARTS LIST

| MODEL CVM | | MODEL CVM | |
|---------------------------------------------------------|---------------------|---------------------------------------------------|---------------------|
| ASSEMBLY No. 822-709-00 | | ASSEMBLY No. 822-709-00 | |
| DRAWING No. 863-519 | | DRAWING No. 863-519 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. | SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | | R305 | 112-917 |
| C301 | 127-073 | R306, R327 | 112-077 |
| C302 | 126-272 | R307 | 113-111 |
| C303 | 126-274 | R308 | 111-005 |
| C304 | 126-273 | R310 | S118-407-03 |
| C305, C308, C326 | 127-315-15 | R311, R347 | 112-932 |
| C306 | 127-062 | R312, R313 | 112-079 |
| C307, C323, C327, C329, C331, C333, C334, C335, C336 | S123-115 | R314 | 112-975 |
| C309, C310 | 126-276 | R315, R323, R346 | 112-954 |
| C311, C332 | 126-091 | R318 | 112-104 |
| C312, C317 | 127-316 | R319 | S118-407-01 |
| C313 | 126-275 | R320 | 112-083 |
| C314 | 126-277 | R321, R331, R354 | 112-095 |
| C315 | 126-279 | R322 | 112-096 |
| C316 | 126-278 | R324 | 112-992 |
| C318, C321 | 126-214 | R326, R344, R353 | 111-015 |
| C319, C320 | 126-034 | R328 | 112-982 |
| C322 | 126-108 | R329, R340, R345 | 112-086 |
| C324, C337 | 128-572 | R332, R336, R350 | 111-001 |
| C325 | 124-076 | R333, R335, R338, R341 | 111-004 |
| C328 | 126-215 | R334, R343 | 112-935 |
| C330 | 126-170 | R339 | 112-919 |
| CRYSTAL | | R355 | 111-002 |
| Y301 | C139-238-00 | R356 | 112-093 |
| DIODES | | R357 | 112-105 |
| CR301 | 137-806 | TRANSFORMERS | |
| CR302, CR303, CR310, CR311 | 139-211 | T301 | C144-766-00 |
| CR304, CR305, CR306, CR307 | 137-316 | T302 | C144-766-01 |
| CR308, CR309 | 137-317 | T303 | C144-766-02 |
| RESISTORS | | T304, T305 | C144-767-00 |
| R301, R309, R317, R337 | 112-101 | T306 | C144-749 |
| R302 | 112-966 | TRANSISTORS | |
| R303, R342 | 112-950 | Q301, Q302, Q303, Q304, Q305, Q311, Q315, Q316 | B130-187 |
| R304, R316, R325, R348, R349, R351, R352 | 112-949 | Q306, Q307, Q310, Q313, Q314, Q317 | B130-168 |
| | | Q308, Q312 | 130-233 |
| | | Q309 | 130-604 |

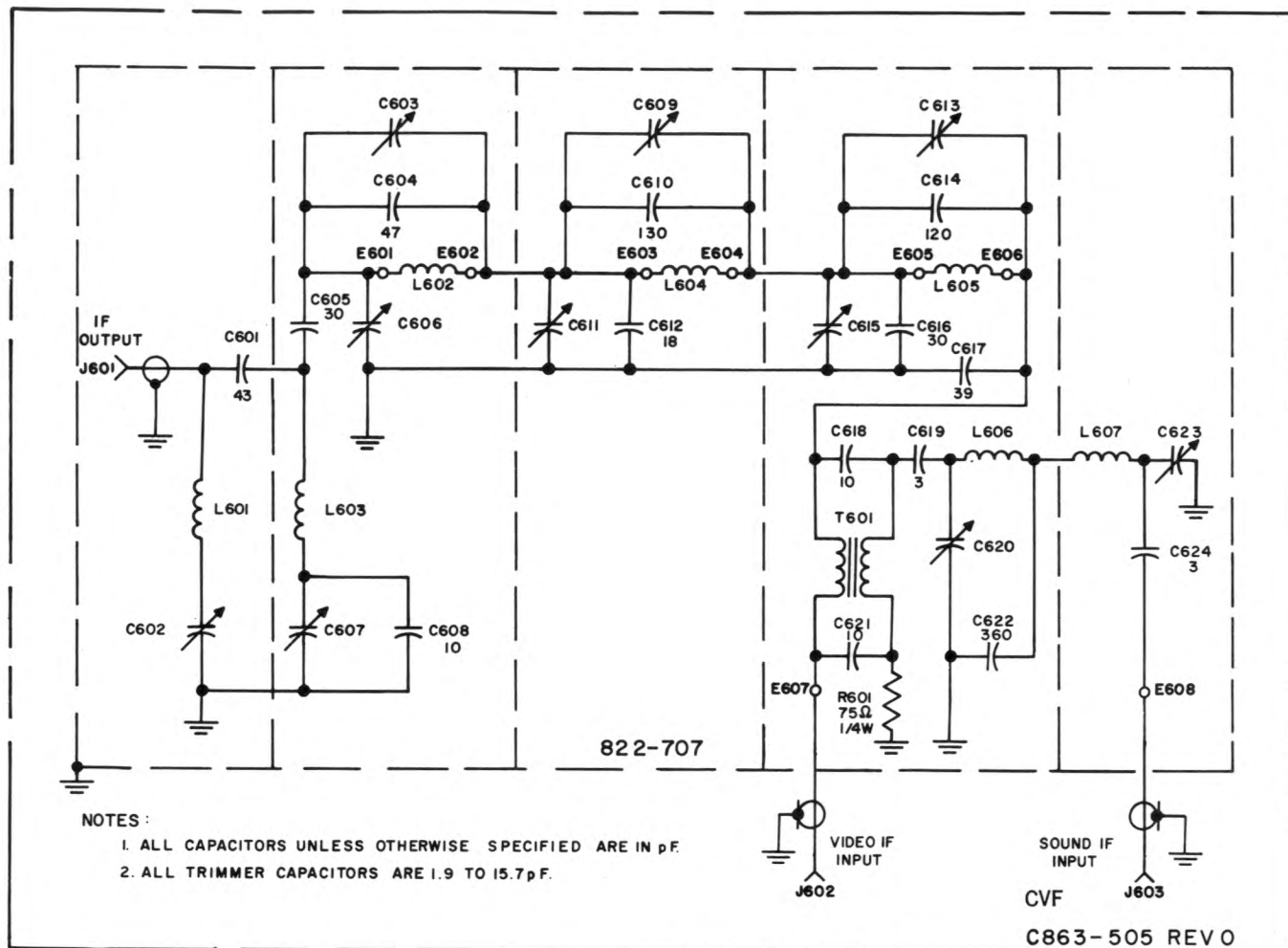


NOTES:
UNLESS OTHERWISE SPECIFIED
1. ALL RESISTOR VALUES ARE IN OHMS
2. ALL CAPACITOR VALUES ARE IN PICO FARADS



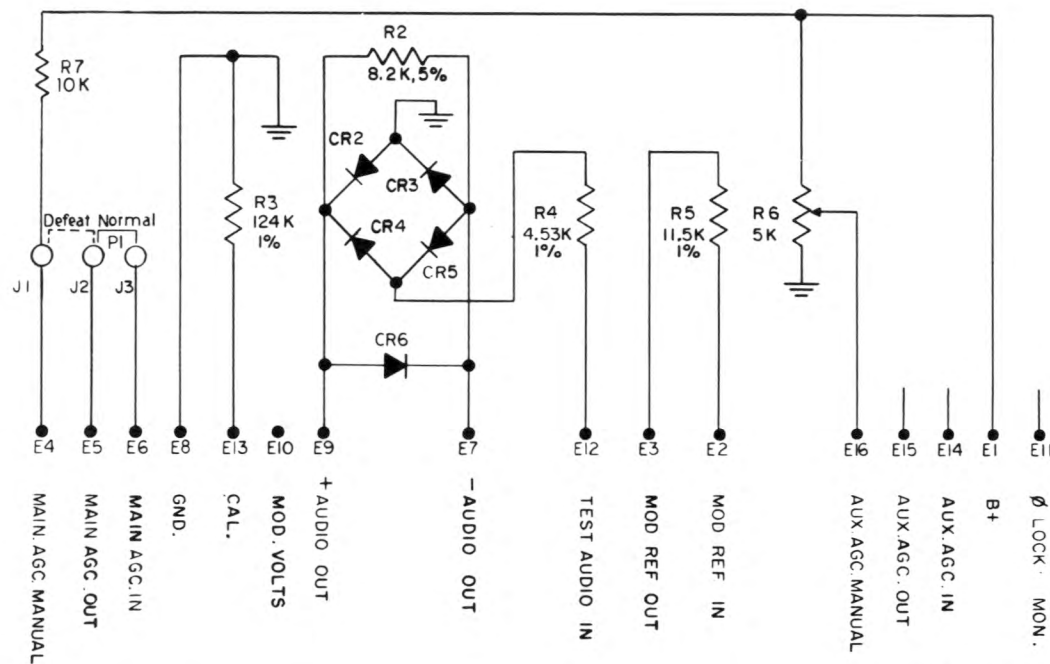
| DESIGN | LAST NO. | DESIGN | LAST NO. |
|--------|----------|--------|----------|
| C | C337 | T | T306 |
| CR | CR311 | TP | TP302 |
| J | J315 | Y | Y301 |
| L | L311 | | |
| P | P312 | | |
| Q | Q317 | | |
| R | R357 | | |

VIDEO MODULATOR
CVM
E863-519 REV. A



REPLACEMENT PARTS LIST

| MODEL CVF | |
|---------------------------------------------------------------|---------------------|
| ASSEMBLY No. 822-707-00 | |
| DRAWING No. 863-505 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C601 | 126-101 |
| C602, C603, C606, C607, C609, C611, C613, C615, C620, C623 | 128-593-00 |
| C604 | 126-102 |
| C605, C616 | 126-098 |
| C608, C618, C621 | 126-170 |
| C610 | 126-097 |
| C612 | 126-237-00 |
| C614 | 126-167 |
| C617 | 126-215 |
| C619, C624 | 122-066 |
| C622 | 126-236-00 |
| RESISTOR | |
| R601 | 112-954 |
| TRANSFORMER | |
| T601 | B144-727-00 |



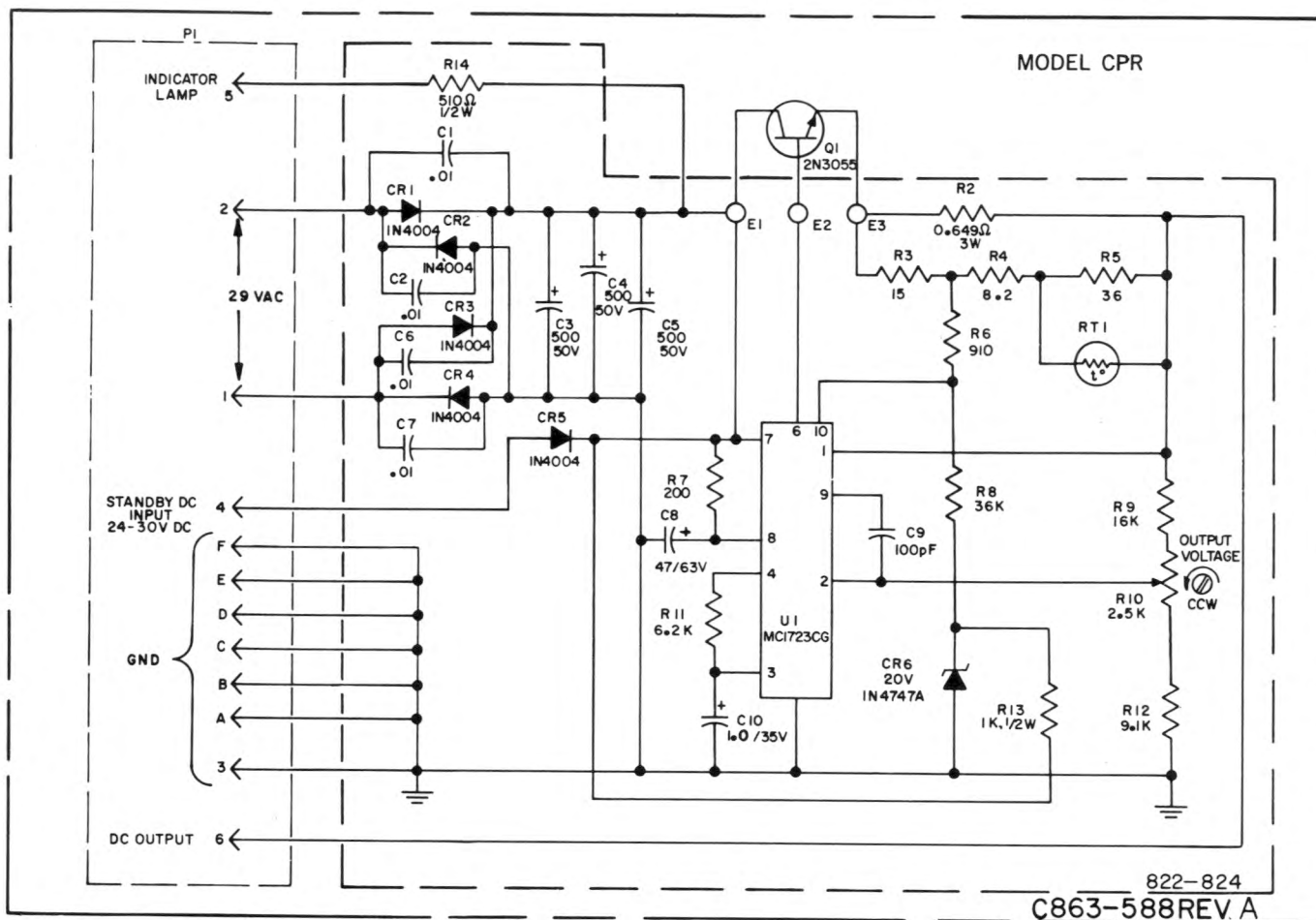
822-840-00

MAG BOARD FOR MODULATOR

C 863-622-00 REV.A

REPLACEMENT PARTS LIST

| MAG BOARD FOR MODULATOR | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-840-00 | |
| DRAWING No. 863-622—Sheet 1 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| DIODES | |
| CR2, CR3, CR4, CR5 | 139-210 |
| CR6 | 139-169 |
| JUMPER | |
| P1 | 184-103-00 |
| RESISTORS | |
| R2 | 111-002 |
| R3 | 115-320-00 |
| R4 | 115-318-00 |
| R5 | 115-319-00 |
| R6 | 118-254-00 |
| R | 112-949 |



NOTES:
UNLESS OTHERWISE SPECIFIED.
1 - ALL RESISTORS ARE IN OHMS
2 - ALL CAPACITORS ARE IN μ F.

REPLACEMENT PARTS LIST

| MODEL CPR | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-824 | |
| DRAWING No. 863-588 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2, C6, C7 | 124-076 |
| C3, C4, C5 | 124-164 |
| C8 | S127-150 |
| C9 | 126-091 |
| C10 | 127-316 |
| DIODES | |
| CR1, CR2, CR3, CR4, CR5 | 127-502 |
| CR6 | 137-781 |
| INTEGRATED CIRCUIT | |
| U1 | 134-006 |
| RESISTORS | |
| R2 | 113-229 |
| R3 | 112-973 |

| MODEL CPR (Cont.) | |
|--------------------------------------------------------|-----------------------------|
| ASSEMBLY No. 822-824 | |
| DRAWING No. 863-588 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| RESISTORS (Continued) | |
| R4 | 112-075 |
| R5 | 112-978 |
| R6 | 112-920 |
| R7 | 112-984 |
| R8 | 111-037 |
| R9 | 112-933 |
| R10 | 118-252 |
| R11 | 112-981 |
| R12 | 112-987 |
| R13 | 112-359 |
| R14 | 112-326 |
| THERMISTOR | |
| RT1 | 110-026 |
| TRANSISTOR | |
| Q1 | S130-146 |

MODEL ICC OSCILLATOR. T7-T11

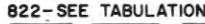
| MODEL ICC OSCILLATOR, T7-T11 | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-757 | |
| DRAWING No. 863-487 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C459 | 124-079 |
| C460 | 128-230-00 |
| C461-T7 | 122-085 |
| C461-T8 | 122-055 |
| C461-T9 | 122-101 |
| C461-T10 | 122-071 |
| C461-T11 | 122-103 |
| C469, C470 | 128-568 |
| CRYSTALS | |
| Y451-T7 | S139-279-40 |
| Y451-T8 | S139-279-41 |
| Y451-T9 | S139-279-42 |
| Y451-T10 | S139-279-43 |
| Y451-T11 | S139-279-44 |
| RESISTORS | |
| R452 | 112-979 |
| R464, R465 | 112-992 |

| MODEL ICC OSCILLATOR, E-I | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-743 | |
| DRAWING No. 863-487 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C451, C465 | 124-077 |
| C459 | 124-087-00 |
| C460, C467 | 128-230-00 |
| C461 | 122-082 |
| C469, C470 | 128-546 |
| CRYSTALS | |
| Y451-E | S139-279-05 |
| Y451-F | S139-279-06 |
| Y451-G | S139-279-07 |
| Y451-H | S139-279-08 |
| Y451-I | S139-279-09 |
| RESISTORS | |
| R452 | 112-966 |
| R457 | 111-074 |
| R464, R465 | 112-077 |
| TRANSISTOR | |
| Q453 | S130-607 |

| MODEL ICC OSCILLATOR, 7-13 | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-744 | |
| DRAWING No. 863-487 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C451, C465 | 124-077 |
| C459 | 124-087-00 |
| C460, C467 | 128-230-00 |
| C461 | 122-047 |
| C469, C470 | 128-546 |
| CRYSTALS | |
| Y451-7 | S139-270-10 |
| Y451-8 | S139-279-11 |
| Y451-9 | S139-279-12 |
| Y451-10 | S139-279-13 |
| Y451-11 | S139-279-14 |
| Y451-12 | S139-279-15 |
| Y451-13 | S139-279-16 |
| RESISTORS | |
| R452 | 112-966 |
| R457 | 111-074 |
| R464, R465 | 112-077 |
| TRANSISTOR | |
| Q453 | S130-607 |

| MODEL ICC OSCILLATOR, J-R | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-745 | |
| DRAWING No. 863-487 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C451, C465 | 124-077 |
| C459 | 122-059 |
| C460 | 128-236 |
| C461 | 122-076 |
| C467 | 128-230 |
| C469, C470 | 128-546 |
| CRYSTALS | |
| Y451-J | S139-279-17 |
| Y451-K | S139-279-18 |
| Y451-L | S139-279-19 |
| Y451-M | S139-279-20 |
| Y451-N | S139-279-21 |
| Y451-O | S139-279-22 |
| Y451-P | S139-279-26 |
| Y451-Q | S139-279-27 |
| Y451-R | S139-279-28 |
| RESISTORS | |
| R452 | 112-966 |
| R457 | 111-074 |
| R464, R465 | 112-077 |
| TRANSISTOR | |
| Q453 | S130-607 |

| MODEL ICC OSCILLATOR, S-W | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-746 | |
| DRAWING No. 863-487 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| Y451-U | S139-279-35 |
| Y451-V | S139-279-36 |
| Y451-W | S139-279-37 |
| RESISTORS | |
| R452 | 112-966 |
| R457 | 111-074 |
| R464, R465 | 112-077 |
| TRANSISTOR | |
| Q453 | S130-607 |

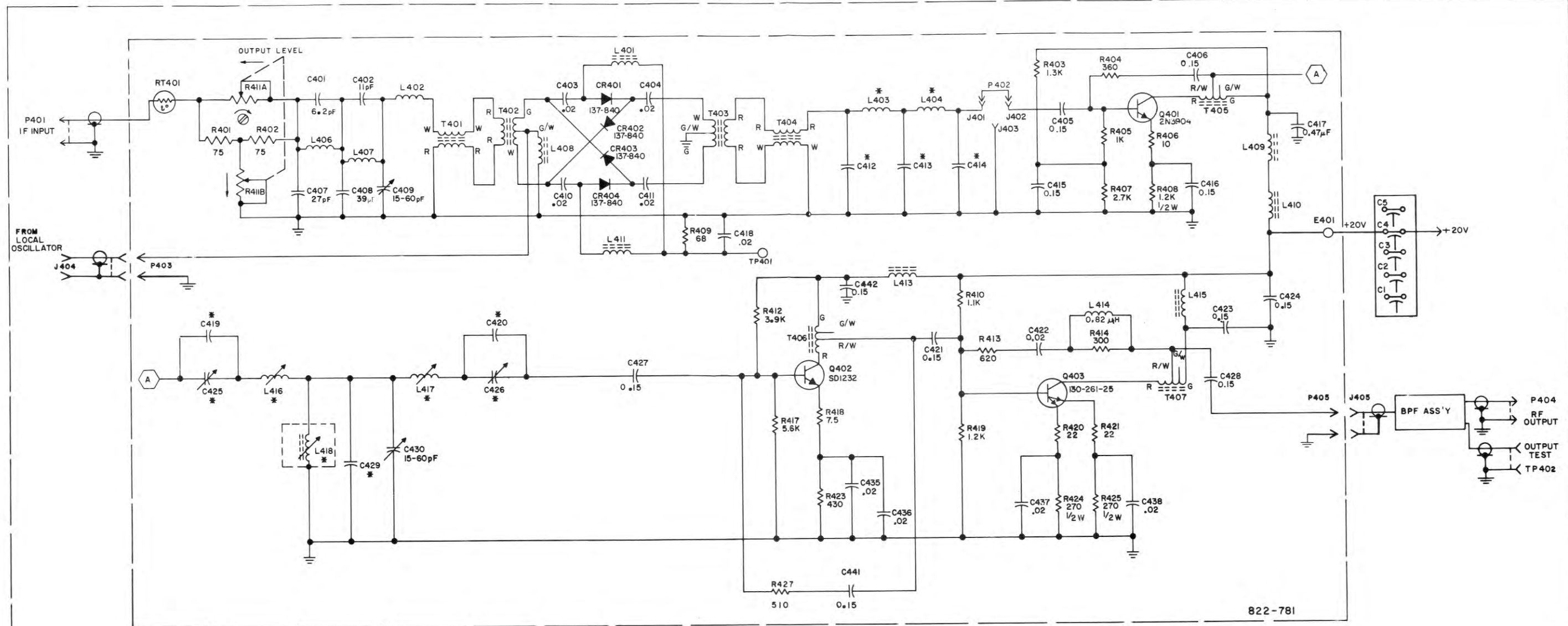


ICC OSCILLATOR

REPLACEMENT PARTS LIST

| MODEL ICC CONVERTER, T7-T11 | |
|------------------------------------------------------------------|------------------|
| ASSEMBLY No. 822-871 | |
| DRAWING No. 863-589 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C401 | 124-139 |
| C402 | 124-048-00 |
| C403, C404, C410, C411, C418, C422, C435, C436, C437, C438 | 120-152 |
| C405, C406, C415, C416, C421, C423, C424, C427, C428, C441, C442 | |
| C407 | 124-120-00 |
| C408 | 124-131 |
| C409, C430 | 128-546 |
| C412-T7 | 126-174 |
| C412-T8 | 126-100 |
| C412-T9 | 126-107 |
| C412-T10 | 126-103 |
| C412-T11 | 126-101 |
| C413-T7 | 126-122 |
| C413-T8 | 126-123 |
| C413-T9 | 126-167 |
| C413-T10 | 126-091 |
| C413-T11 | 126-166 |
| C414-T7 | 126-174 |
| C414-T8 | 126-100 |
| C414-T9 | 126-107 |
| C414-T10 | 126-103 |
| C414-T11 | 126-101 |
| C417 | 124-066 |
| C419-T7, C420-T7 | 126-122 |
| C419-T8, C421-T8 | 126-107 |
| C425-T7, T8, T9 | 128-546 |
| C426-T7, T8, T9 | 128-546 |
| C429-T7 | 126-114 |
| C429-T8, T9, T10, T11 | 126-113 |
| DIODES | |
| CR401, CR402, CR403, CR404 | 137-840 |

| MODEL ICC CONVERTER, T7-T11 | |
|---------------------------------------------|------------------|
| ASSEMBLY No. 822-871 | |
| DRAWING No. 863-589 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| JUMPER | |
| P402 | 184-103-00 |
| RESISTORS | |
| R401, R402 | 112-954 |
| R403 | 112-064 |
| R404 | 112-098 |
| R405 | 112-977 |
| R406 | 112-077 |
| R407 | 112-931 |
| R408 | 112-371 |
| R409 | 112-916 |
| R410 | 112-927 |
| R411 | S118-600 |
| R412 | 112-979 |
| R413 | 112-998 |
| R414 | 112-096 |
| R417 | 112-919 |
| R418 | 112-074 |
| R419 | 112-921 |
| R420, R421 | 112-971 |
| R423 | 112-100 |
| R424, R425 | 112-287 |
| R427 | 112-929 |
| THERMISTOR | |
| RT401 | 110-313-00 |
| TRANSFORMERS | |
| T401, T404 | B144-734 |
| T402, T403 | B144-735 |
| T405, T406, T407 | 144-350 |
| TRANSISTORS | |
| Q401 | 130-226 |
| Q402 | 130-604 |
| Q403 | S130-261-25 |



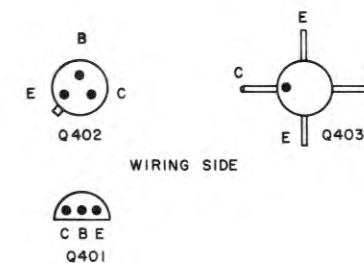
NOTES:

- UNLESS OTHERWISE SPECIFIED:
A. ALL RESISTANCES ARE IN OHMS, 5%, 1/4 W.
B. ALL CAPACITANCES ARE IN μ F.

- * SEE CHART FOR VALUES

| DESIG. | LAST NO. USED | MINIMUMS |
|--------|---------------|----------|
| C | C442 | 130-226 |
| CR | CR404 | 130-226 |
| J | J408 | 130-226 |
| L | L418 | 130-226 |
| P | P408 | 130-226 |
| Q | Q403 | 130-226 |
| R | R427 | 130-226 |
| RT | RT401 | 130-226 |
| T | T407 | 130-226 |
| TP | TP408 | 130-226 |
| E | E401 | 130-226 |

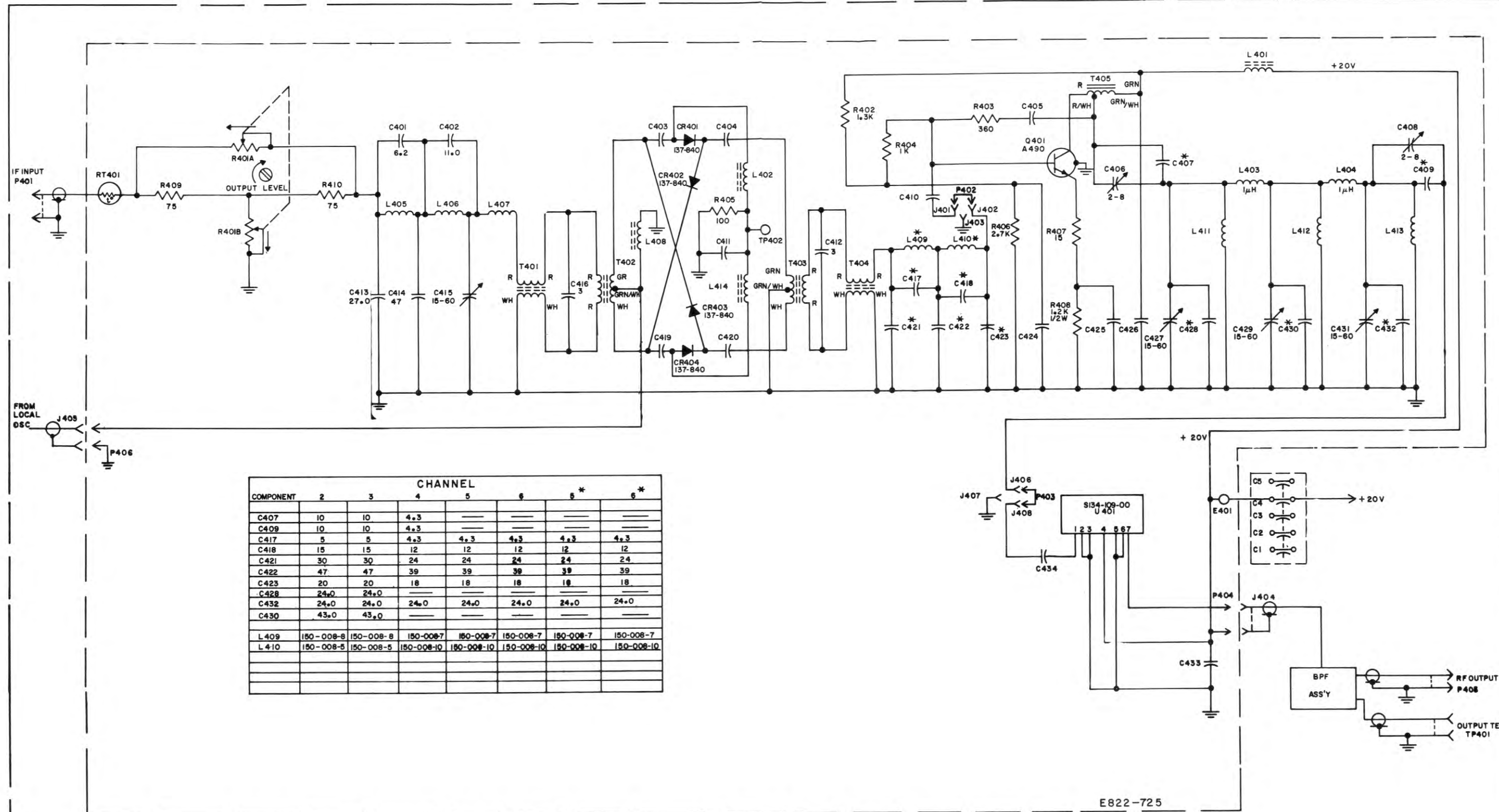
| COMPONENT | CHANNEL | | | | |
|-----------|------------|------------|------------|------------|------------|
| | T7 | T8 | T9 | T10 | T11 |
| C412 | 110 pF | 75 pF | 62 pF | 50 pF | 43 pF |
| C413 | 220 pF | 160 pF | 120 pF | 100 pF | 82 pF |
| C414 | 110 pF | 75 pF | 62 pF | 50 pF | 43 pF |
| C419 | 220 pF | 62 pF | — | — | — |
| C420 | 220 pF | 62 pF | — | — | — |
| C425 | 15-60 pF | 15-60 pF | 15-60 pF | 9-35 pF | 9-35 pF |
| C426 | 15-60 pF | 15-60 pF | 15-60 pF | 9-35 pF | 9-35 pF |
| C429 | 330 pF | 300 pF | 300 pF | 300 pF | 300 pF |
| L403 | 19T | 15T | 12T | 11T | 10T |
| L404 | 19T | 15T | 12T | 11T | 10T |
| L416 | 155-636-00 | 155-636-00 | 155-636-00 | 155-636-00 | 155-636-00 |
| L417 | 155-636-00 | 155-636-00 | 155-636-00 | 155-636-00 | 155-636-00 |
| L418 | 155-635-00 | 155-635-01 | 155-635-02 | 155-635-03 | 155-635-00 |



ICC CONVERTER
T7-T11
E 863-589 REV. 0

REPLACEMENT PARTS LIST

| MODEL ICC/ICCP CONVERTER, 2-6, 5* and 6* | |
|------------------------------------------------------------------------------|---------------------|
| ASSEMBLY No. 822-725 | |
| DRAWING No. 863-486 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C401 | 124-139-00 |
| C402 | 124-048-00 |
| C403, C404, C405, C410, C411, C419, C420, C424, C425, C426, C433, C434 | S124-078 |
| C406, C408 | 128-546 |
| C407, C409-2, 3 | 124-137-00 |
| C407, C409-4 | 124-087-00 |
| C412, C416 | 122-066 |
| C413 | 124-120-00 |
| C414 | 124-195 |
| C415, C427, C429, C431 | 128-224 |
| C417-2, 3 | 124-127 |
| C417-4, 5, 6, 5*, 6* | 124-087-00 |
| C418-2, 3 | 124-143-00 |
| C418-4, 5, 6, 5*, 6* | 124-135-00 |
| C421-2, 3 | 124-121-00 |
| C421-4, 5, 6, 5*, 6* | 124-176 |
| C422-2, 3 | 124-122 |
| C422-4, 5, 6, 5*, 6* | 124-131 |
| C423-2, 3 | 124-119-00 |
| C423-4, 5, 6, 5*, 6* | 124-079-00 |
| C428-2, 3 | 126-188 |
| C430-2, 3, 4, 5, 6, 5*, 6* | 126-188 |
| C432-2, 3 | 126-101 |
| DIODES | |
| CR401, CR402, CR403, CR404 | 137-840 |
| INTEGRATED CIRCUITS | |
| U401 | S134-109-00 |
| RESISTORS | |
| R401 | S118-600 |
| R402 | 112-064 |
| R403 | 112-098 |
| R404 | 112-977 |
| R405 | 112-950 |
| R406 | 112-931 |
| R407 | 112-973 |
| R408 | 112-371 |
| R409, R410 | 112-954 |
| THERMISTOR | |
| RT401 | 110-313-00 |
| TRANSISTOR | |
| Q401 | 130-152-2 |



REPLACEMENT PARTS LIST

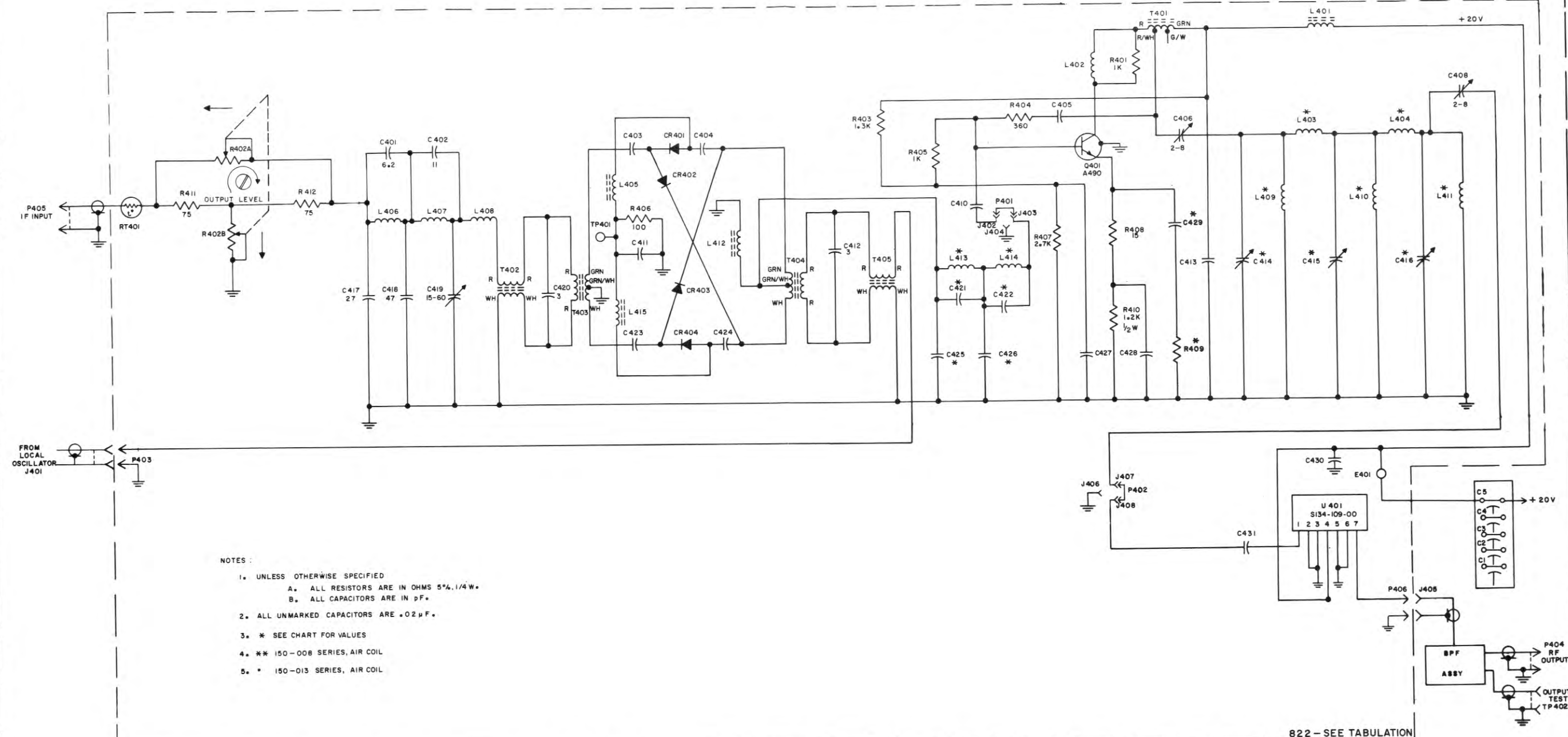
| MODEL ICC/ICCP CONVERTER, A-W, 7-13 | |
|------------------------------------------------------------------------------|---------------------|
| ASSEMBLY No. 822-724 | |
| DRAWING No. 863-524 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C401 | 124-139-00 |
| C402 | 124-048-00 |
| C403, C404, C405, C410, C411, C413, C423, C424, C427, C428, C430, C431 | S124-078 |
| C406, C408 | 128-546 |
| C412, C420 | 122-066 |
| C417 | 124-120-00 |
| C418 | 124-195 |
| C419 | 128-224 |
| DIODES | |
| CR401, CRR402, CR403, CR404 | 137-840 |
| INTEGRATED CIRCUIT | |
| U401 | S134-109-00 |
| JUMPERS | |
| P401, P402 | 184-103-00 |
| RESISTORS | |
| R401, R405 | 112-977 |
| R402 | S118-600 |
| R403 | 112-064 |
| R404 | 112-098 |
| R406 | 112-950 |
| R407 | 112-931 |
| R408 | 112-973 |
| R410 | 112-371 |
| R411, R412 | 112-954 |
| THERMISTOR | |
| RT401 | 110-313-00 |
| TRANSFORMERS | |
| T401 | B144-350 |
| T402, T405 | B144-734-00 |
| T403, T404 | B144-735-00 |
| TRANSISTOR | |
| Q401 | S130-152-02 |

| MODEL ICC/ICCP CONVERTER, A-I | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-737 | |
| DRAWING No. 863-524 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C414, C415, C416 | 128-565 |
| C421 | 124-143-00 |
| C422-A, B, C, D | 124-061-00 |
| C422-E, F, G, H, I | 124-087-00 |
| C425-A, B | 124-102-00 |
| C425-C, D, E | 124-137-00 |
| C425-F | 124-108-00 |
| C425-G, H, I | 124-103-00 |
| C426-A, B | 124-176 |
| C426-C, D | 124-105-00 |
| C426-E, F, G | 124-119-00 |
| C426-H, I | 124-079-00 |
| C429-I | 124-162 |
| RESISTOR | |
| R409-I | 112-083 |

| MODEL ICC/ICCP CONVERTER, J-R | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-738 | |
| DRAWING No. 863-524 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C414, C416 | 128-546 |
| C415-J, K, L, M | 128-566 |
| C415-N, O, P, Q, R | 128-546 |
| C421-J, K, L, M | 124-115-00 |
| C421-N, O, P, Q | 124-135-00 |
| C421-R | 124-137-00 |
| C422-J, K, L | 124-086-00 |
| C422-M, N, O, P, Q, R | 124-113-00 |
| C425-J, K, L | 124-127-00 |
| C425-M, N, O | 124-061-00 |
| C425-P, Q | 124-087-00 |
| C425-R | 124-086-00 |
| C426 | 124-135-00 |
| C429-J, K, L, M, N, O, P | 124-162 |
| C429-Q, R | 128-230-00 |
| RESISTOR | |
| R409 | 112-083 |

| MODEL ICC/ICCP CONVERTER, 7-13 | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-736 | |
| DRAWING No. 863-524 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C414, C415, C416 | 128-565 |
| C421 | 124-115-00 |
| C422 | 124-086-00 |
| C425-7, 8, 9 | 124-112-00 |
| C425-10, 11 | 124-139-00 |
| C425-12, 13 | 124-084-00 |
| C426-7, 8, 9, 10 | 124-143-00 |
| C426-11, 12, 13 | 124-115-00 |
| C429 | 124-162 |
| RESISTOR | |
| R409 | 112-083 |

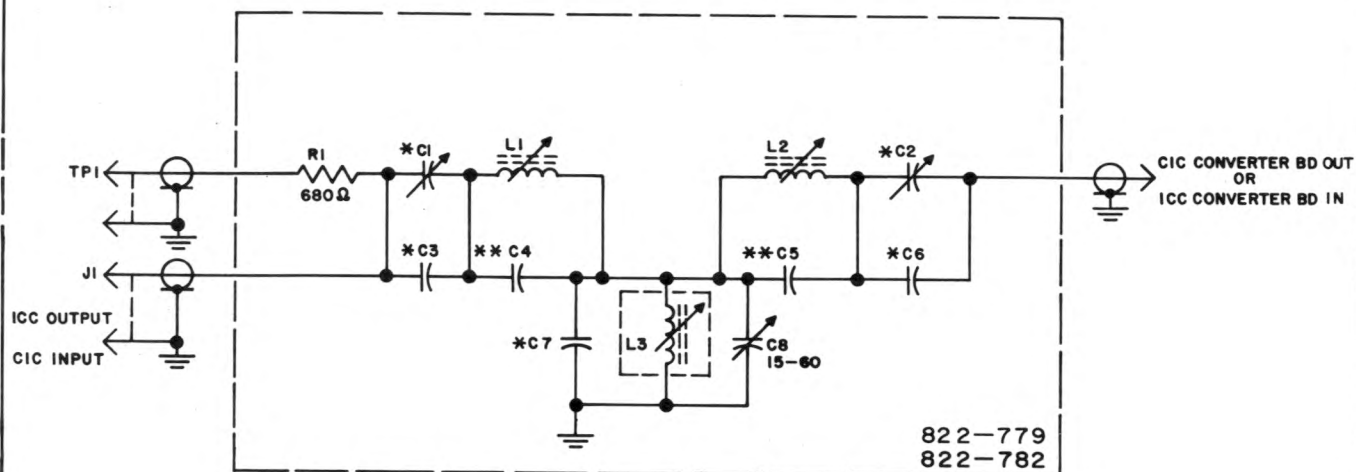
| MODEL ICC/ICCP CONVERTER, S-W | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-739 | |
| DRAWING No. 863-524 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C414, C415, C416 | 128-546 |
| C421-S, T, U | 124-137-00 |
| C421-V, W | 124-108 |
| C422 | 124-113-00 |
| C425-S | 124-086-00 |
| C425-T, U, V, W | 124-113-00 |
| C426-S, T, U | 124-137-00 |
| C426-V, W | 124-108 |
| C429 | 128-230-00 |
| RESISTOR | |
| R409 | 112-083 |

[illegible]

| ASSY NO. | CHANNEL |
|----------|-------------|
| 822-724 | SUB - ASS'Y |
| 822-736 | 7-13 |
| 822-737 | A - I |
| 822-738 | J - R |
| 822-739 | S - W |

| DESIG. | LAST NO. USED | NUMBERS NOT USED | DESIG. | LAST NO. USED | NUMBERS NOT USED |
|--------|---------------|------------------|--------|---------------|------------------|
| C | C431 | 407 429 | RT | RT401 | |
| CR | CR 404 | | T | T 405 | |
| J | J410 | | U | U 401 | |
| L | L 415 | | TP | TP402 | |
| P | P406 | | E | E401 | |
| Q | Q401 | | | | |
| R | R412 | | | | |

ICC/ICCP CONVERTER
A-W, 7-13
E863-524 REV. A



| CHANNEL | C1 | C2 | C3 | C4 | C5 | C6 | C7 | L3 |
|---------|-------|-------|-----|-----|-----|-----|-----|----------------------------------|
| T7 | 15-60 | 15-60 | 220 | 110 | 110 | 220 | 330 | 13 ³ / ₄ T |
| T8 | 15-60 | 15-60 | 62 | 24 | 24 | 62 | 300 | 6 ³ / ₄ T |
| T9 | 15-60 | 15-60 | — | — | — | — | 300 | 3 ³ / ₄ T |
| T10 | 9-35 | 9-35 | — | — | — | — | 300 | 2 ³ / ₄ T |
| T11 | 9-35 | 9-35 | — | — | — | — | 300 | 2 T |

NOTES:

- 1- ** DENOTES THAT IT IS ON ICC, CHAN. T7, T8 ONLY.
- 2- * SEE CHART FOR VALUES.
- 3- ALL CAPACITORS ARE IN pF.

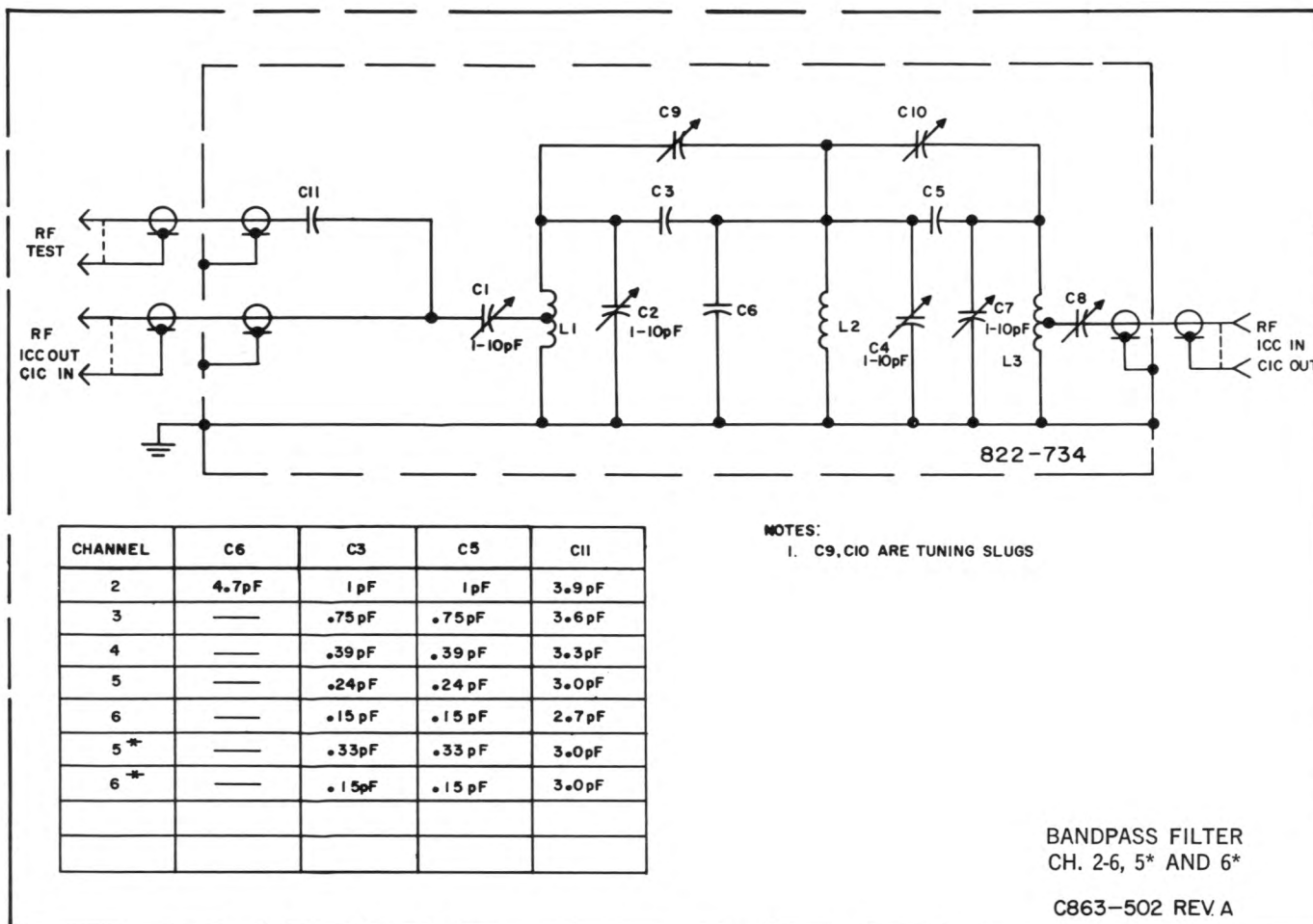
BANDPASS FILTER
T-CHANNELS

C863-522 REV 0

REPLACEMENT PARTS LIST

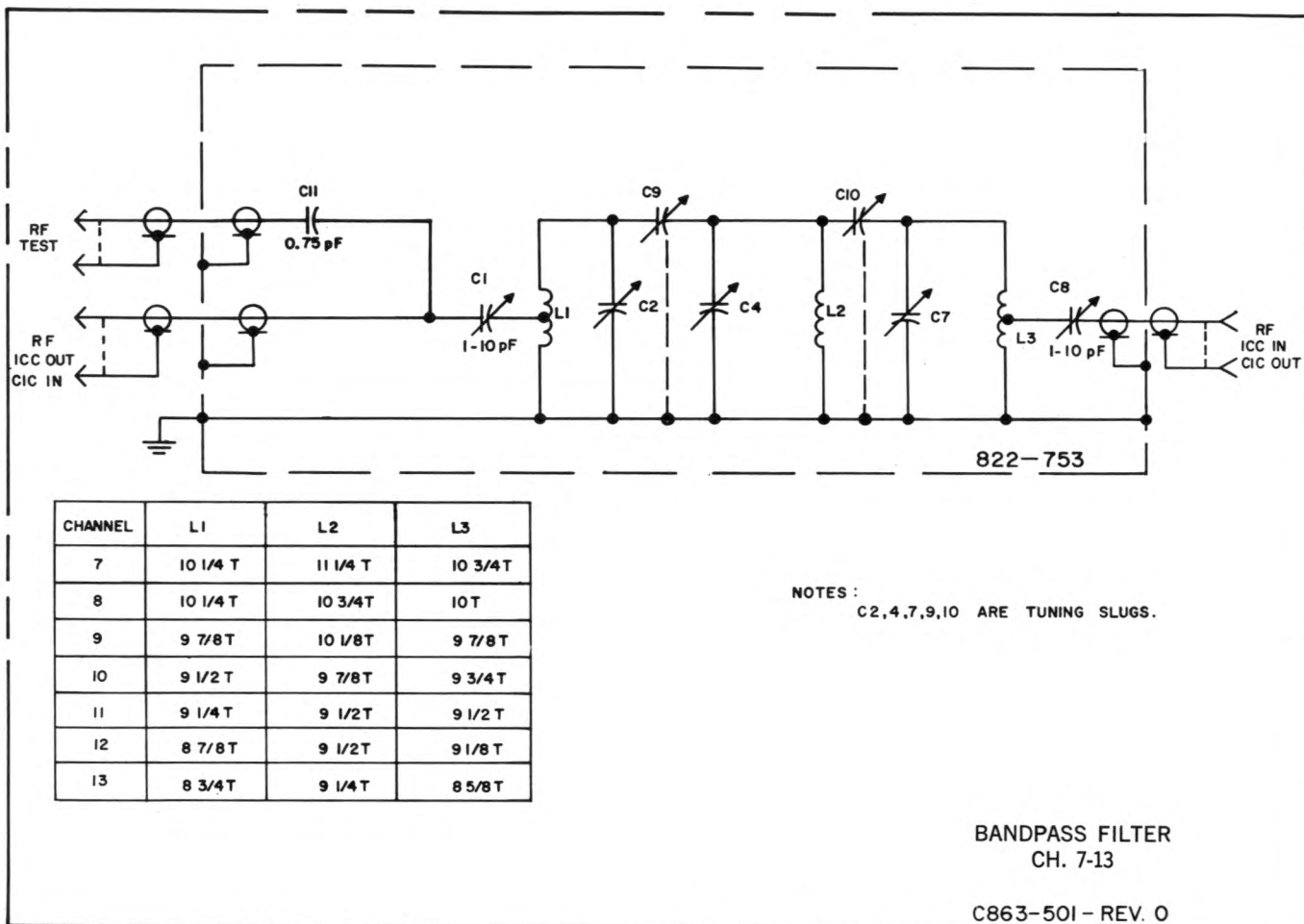
| BANDPASS FILTER, T-CHANNELS | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-782 | |
| DRAWING No. 863-522 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| CIC-T7 | |
| C1, C2, C8 | 128-224 |
| C3, C6 | 126-122 |
| C7 | 126-114 |
| CIC-T8 | |
| C1, C2, C8 | 128-224 |
| C3, C6 | 126-107 |
| C7 | 126-113 |
| CIC/ICC-T9 | |
| C1, C2, C8 | 126-224 |
| C7 | 126-113 |
| CIC/ICC-T10 | |
| C1, C2 | 128-565 |
| C7 | 126-113 |
| C8 | 128-224 |
| CIC/ICC-T11 | |
| C1, C2 | 128-565 |
| C7 | 126-113 |
| C8 | 128-224 |

| BANDPASS FILTER, T-CHANNELS | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-782 | |
| DRAWING No. 863-522 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| ICC-T7 | |
| C1, C2, C8 | 128-224 |
| C3, C6 | 126-122 |
| C4, C5 | 126-174 |
| C7 | 126-114 |
| ICC-T8 | |
| C1, C2, C8 | 128-224 |
| C3, C6 | 126-107 |
| C4, C5 | 126-188 |
| C7 | 126-113 |
| COIL ASSEMBLIES | |
| L3-CIC-T7, ICC-T7 | B155-635-00 |
| L3-CIC-T8, ICC-T8 | B155-635-01 |
| L3-CIC/ICC-T9 | B155-638-02 |
| L3-CIC/ICC-T10 | B155-635-03 |
| L3-CIC/ICC-T11 | B155-638-00 |
| L1, L2 (all channels) | B155-636-00 |
| RESISTOR | |
| R1 | 112-105 |



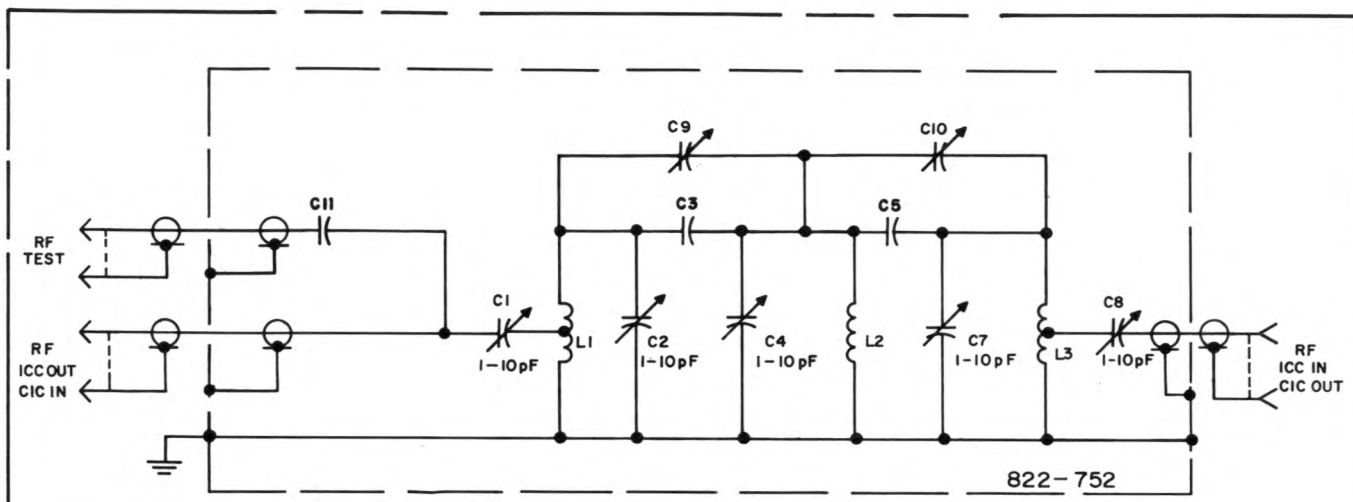
REPLACEMENT PARTS LIST

| BANDPASS FILTER, CH. 2-6, 5*, 6* | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-734 | |
| DRAWING No. 863-502 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2, C4, C7, C8 | 128-590-00 |
| C3, C5-2 | 122-055 |
| C3, C5-3 | 122-071 |
| C3, C5-4 | 122-089 |
| C3, C5-5 | 122-047 |
| C3, C5-6, 6* | 122-100 |
| C3, C5-5* | 122-082 |
| C6-2 | 124-061-00 |
| C11-2 | 122-059 |
| C11-3 | 122-068 |
| C11-4 | 122-057 |
| C11-5, 5*, 6* | 122-066 |
| C11-6 | 122-081 |
| COIL ASSEMBLIES | |
| L1 | D155-621-02 |
| L2 | D155-621-01 |
| L3 | D155-621-00 |
| TUNING SLUGS | |
| C9, C10 | 716-145 |



REPLACEMENT PARTS LIST

| BANDPASS FILTER, CH. 7-13 | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-753 | |
| DRAWING No. 863-501 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C8 | 128-590-00 |
| C11 | 122-071 |
| COIL ASSEMBLIES | |
| L1-7, 8 | D155-621-08 |
| L2-7 | D155-621-07 |
| L3-7 | D155-621-06 |
| L2-8 | D155-621-10 |
| L3-8 | D155-621-09 |
| L1-9 | D155-621-13 |
| L2-9 | D155-621-01 |
| L3-9 | D155-621-21 |
| L1-10 | D155-621-16 |
| L2-10 | D155-621-15 |
| L3-10 | D155-621-14 |
| L1-11 | D155-621-19 |
| L2-11, 12 | D155-621-18 |
| L3-11 | D155-621-17 |
| L1-12 | D155-621-22 |
| L3-12 | D155-621-12 |
| L1-13 | D155-621-25 |
| L2-13 | D155-621-24 |
| L3-13 | D155-621-23 |
| TUNING SLUGS | |
| C2, C4, C7, C9, C10 | 716-145 |



| CHANNEL | C3 | C5 | L1 | L2 | L3 | C11 |
|---------|---------|---------|--------|--------|--------|-----|
| A | 0.10 pF | 0.10 pF | 6 1/8T | 6 1/8T | 6 1/8T | 1.6 |
| B | 0.10 pF | 0.10 pF | 6 1/8T | 6 1/8T | 6 1/8T | 1.5 |
| C | GIMMICK | GIMMICK | 6 1/8T | 6 1/8T | 6 1/8T | 1.5 |
| D | ↑ | ↑ | 6 1/8T | 6 1/8T | 6 1/8T | 1.3 |
| E | ↑ | ↑ | 6 1/8T | 6 1/8T | 6 1/8T | 1.3 |
| F | ↑ | ↑ | 6 1/8T | 6 1/8T | 6 1/8T | 1.3 |
| G | GIMMICK | GIMMICK | 6 1/8T | 6 1/8T | 6 1/8T | 1.1 |
| H | OMIT | OMIT | 6 1/8T | 6 1/8T | 6 1/8T | 1.1 |
| I | OMIT | OMIT | 6 1/8T | 6 1/8T | 6 1/8T | 1.1 |

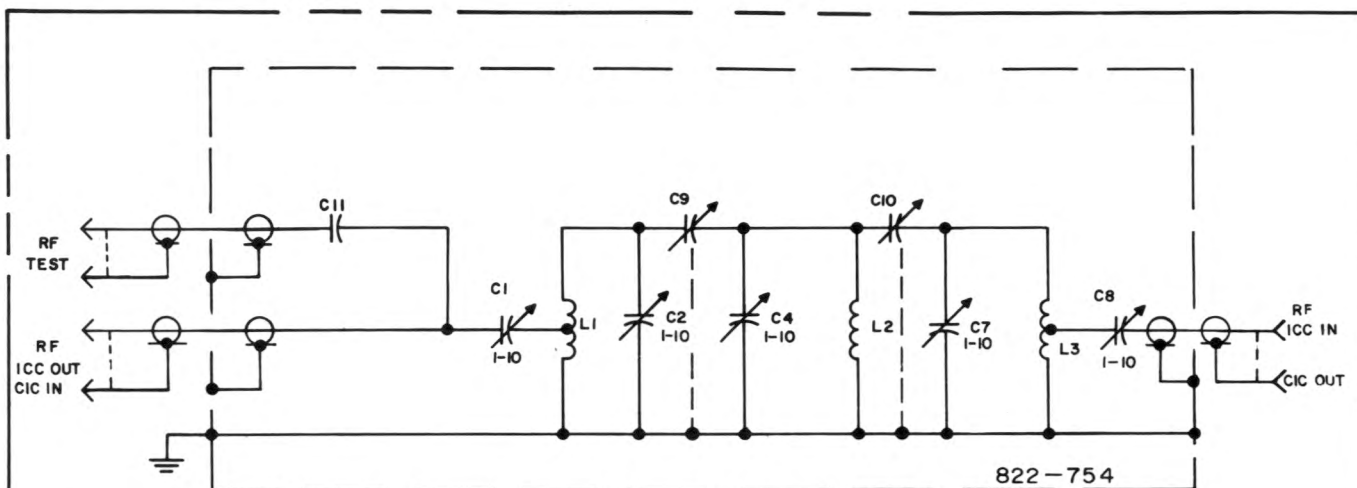
NOTES:
C9 AND C10 ARE TUNING SLUGS

BANDPASS FILTER
CH. A-I

C863-500 REV 0

REPLACEMENT PARTS LIST

| BANDPASS FILTER, CH. A-I | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-752 | |
| DRAWING No. 863-500 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2, C4, C7, C8 | 128-590-00 |
| C3-A, B; C5-A, B | 122-028 |
| C11-A | 122-098 |
| C11-B, C | 122-056 |
| C11-D, E, F | 122-085 |
| C11-G, H, I | 122-088 |
| COIL ASSEMBLIES | |
| L1 | D155-621-05 |
| L2 | D155-621-04 |
| L3 | D155-621-03 |
| TUNING SLUGS | |
| C9, C10 | 716-145 |



| CHANNEL | L1 | L2 | L3 | C11 |
|---------|---------|---------|---------|------|
| J | 8 1/8 T | 8 3/4 T | 8 1/4 T | 0.56 |
| K | 7 3/4 T | 8 3/4 T | 8.0 T | 0.56 |
| L | 7 1/2 T | 8 1/4 T | 7 3/4 T | 0.56 |
| M | 7 3/8 T | 8.0 T | 7 1/2 T | 0.56 |
| N | 7 1/8 T | 7 3/4 T | 7 1/4 T | 0.56 |
| O | 7.0 T | 7 1/2 T | 7 1/4 T | 0.39 |
| P | 6 3/4 T | 7 1/2 T | 7.0 T | 0.39 |
| Q | 6 5/8 T | 7 1/4 T | 6 7/8 T | 0.39 |
| R | 6 1/2 T | 7.0 T | 6 3/4 T | 0.39 |

NOTES :

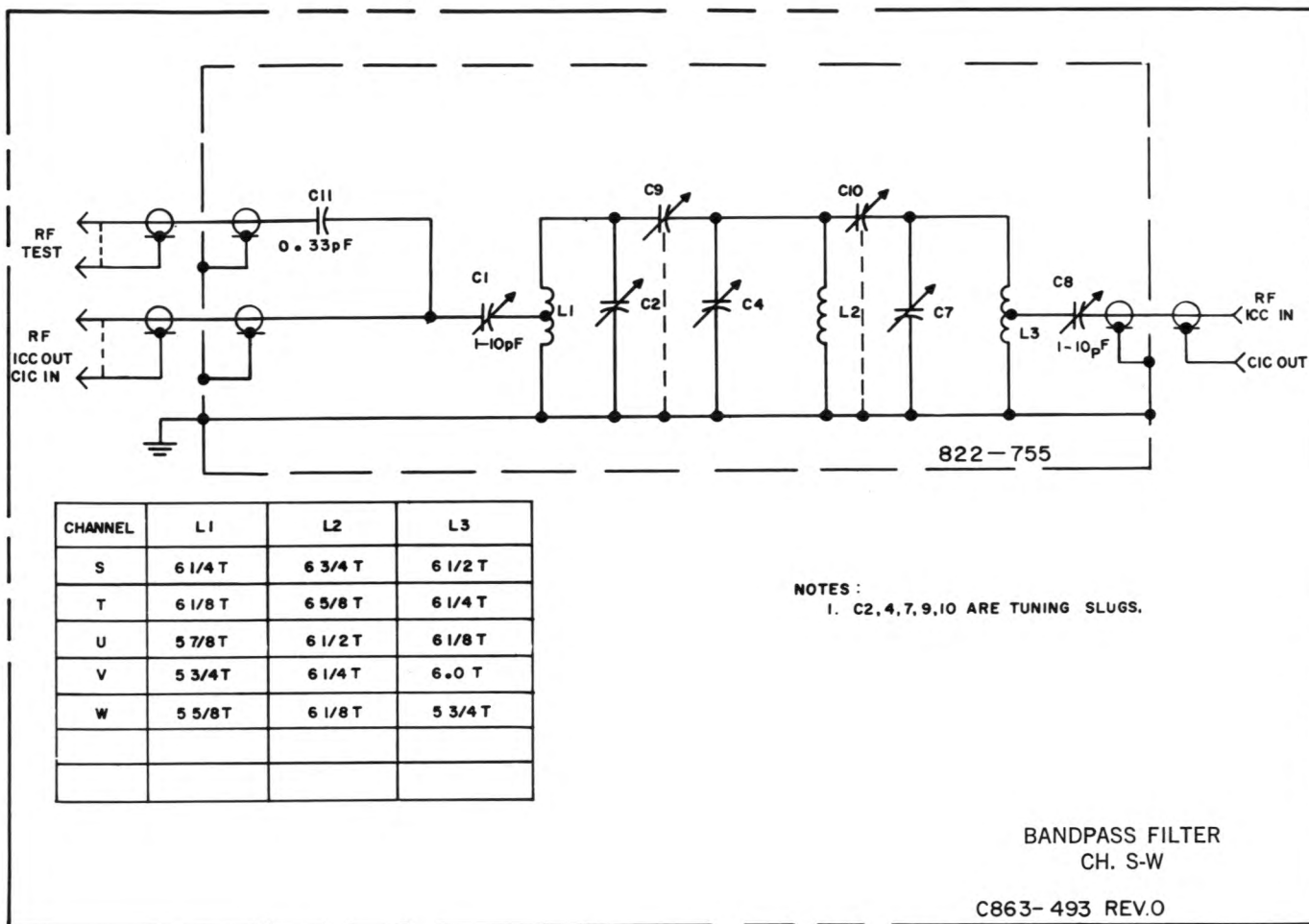
1. C2, 4, 7, 9, 10 ARE TUNING SLUGS
2. ALL CAPACITORS ARE IN P.F. UNLESS OTHERWISE SPECIFIED.

BANDPASS FILTER
CHS. J to R

C863-492- REV. O

REPLACEMENT PARTS LIST

| BANDPASS FILTER, CHS. J to R | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-754 | |
| DRAWING No. 863-492 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C8 | 128-590-00 |
| C11-J, K, L, M, N | 122-095 |
| C11-O, P, Q, R | 122-089 |
| COIL ASSEMBLIES | |
| L1-J | D155-621-28 |
| L2-J | D155-621-27 |
| L3-J | D155-621-26 |
| L1-K | D155-621-31 |
| L2-K | D155-621-30 |
| L3-K | D155-621-29 |
| L1-L | D155-621-34 |
| L2-L | D155-621-33 |
| L3-L | D155-621-32 |
| L1-M | D155-621-37 |
| L2-M | D155-621-36 |
| L3-M | D155-621-35 |
| L1-N | D155-621-40 |
| L2-N | D155-621-39 |
| L3-N, O | D155-621-38 |
| L1-O | D155-621-42 |
| L2-O, P | D155-621-41 |
| L1-P | D155-621-44 |
| L3-P | D155-621-43 |
| L1-Q | D155-621-47 |
| L2-Q | D155-621-46 |
| L3-Q | D155-621-45 |
| L1-R | D155-621-50 |
| L2-R | D155-621-49 |
| L3-R | D155-621-48 |
| TUNING SLUGS | |
| C2, C4, C7, C9, C10 | 716-145 |

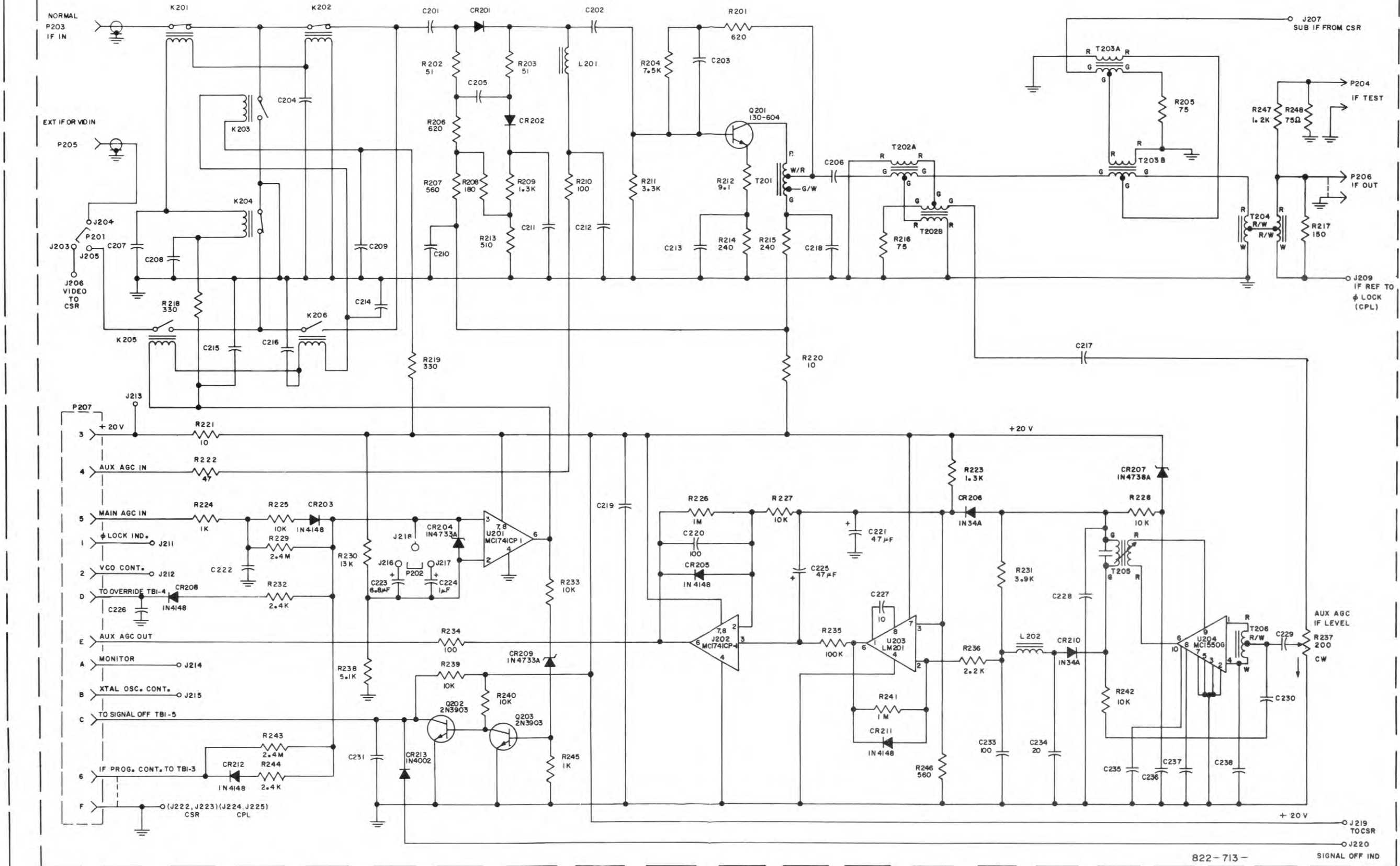


REPLACEMENT PARTS LIST

| BANDPASS FILTER, CH. S-W | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-755 | |
| DRAWING No. 863-493 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C8 | 128-590-00 |
| C11 | 122-082 |
| COIL ASSEMBLIES | |
| L1-S | D155-621-53 |
| L2-S | D155-621-52 |
| L3-S | D155-621-51 |
| L1-T | D155-621-67 |
| L2-T | D155-621-55 |
| L3-T | D155-621-54 |
| L1-U | D155-621-57 |
| L2-U | D155-621-56 |
| L3-U | D155-621-65 |
| L1-V | D155-621-60 |
| L2-V | D155-621-59 |
| L3-V | D155-621-58 |
| L1-W | D155-621-62 |
| L2-W | D155-621-66 |
| L3-W | D155-621-61 |
| TUNING SLUGS | |
| C2, C4, C9, C10 | 716-145 |

REPLACEMENT PARTS LIST

| MODEL CAX | | MODEL CAX (Cont.) | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|---------------------------------------------|------------------|
| ASSEMBLY No. 822-713-01 | | ASSEMBLY No. 822-713-01 | |
| DRAWING No. 863-517 | | DRAWING No. 863-517 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. | SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | | RESISTORS (Continued) | |
| C201, C202, C203, C204, C205, C206, C207, C208, C209, C210, C211, C212, C213, C214, C215, C216, C217, C218, C219, C222, C226, C228, C229, C230, C231, C235, C236, C237, C238 | 124-078 | R204 | 112-986 |
| C220, C233 | 124-042 | R205, R216, R248 | 112-954 |
| C221, C225 | 127-330-00 | R207, R246 | 112-104 |
| C223 | 127-313 | R208 | 112-994 |
| C224 | 127-316 | R209, R223 | 112-064 |
| C227 | 124-137 | R210, R234 | 112-950 |
| C234 | 124-119 | R211 | 112-936 |
| DIODES | | R212 | 112-076 |
| CR201, CR202 | S137-309 | R213 | 112-929 |
| CR203, CR205, CR208, CR211, CR212 | 137-824 | R214, R215 | 112-977 |
| CR204, CR209 | 137-805 | R217 | 112-974 |
| CR206, CR210 | 139-261 | R218, R219 | 112-097 |
| CR207 | 137-808 | R220, R221 | 112-077 |
| CR213 | 137-686 | R222 | 112-992 |
| INTEGRATED CIRCUITS | | R224, R245 | 112-977 |
| U201, U202 | 134-506-00 | R225, R227, R228, R233, R239, R240, R242 | 112-949 |
| U203 | 134-516-00 | R226, R241 | 111-041 |
| U204 | 130-223 | R229, R243 | 111-751 |
| JUMPERS | | R230 | 112-989 |
| P201, P202 | 184-103-00 | R231 | 112-979 |
| RELAYS | | R232, R244 | 112-918 |
| K201, K202, K203, K204, K205, K206 | 163-033-00 | R235 | 112-935 |
| RESISTORS | | R236 | 112-932 |
| R201, R206 | 112-998 | R237 | 118-232 |
| R202, R203 | 112-087 | R238 | 112-980 |
| | | R247 | 112-921 |
| | | TRANSFORMERS | |
| | | T201 | B144-738 |
| | | T202, T203 | C144-467 |
| | | T204 | C144-740 |
| | | T205 | B155-622 |
| | | T206 | B144-737 |
| | | TRANSISTORS | |
| | | Q201 | 130-604 |
| | | Q202, Q203 | B130-187 |

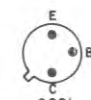


| TAB | MODEL | T205 CAP |
|-----|-------|----------|
| -00 | CAX | 3.9 |
| -01 | CAX* | 15 |

NOTES:
UNLESS OTHERWISE SPECIFIED:
1. ALL RESISTORS ARE IN OHMS, 5%, 1/4W
2. ALL CAPACITORS ARE IN pF
3. ALL UNMARKED CAPACITORS ARE .02 μF
4. RELAYS SHOWN IN NORMAL OPERATING POSITION.



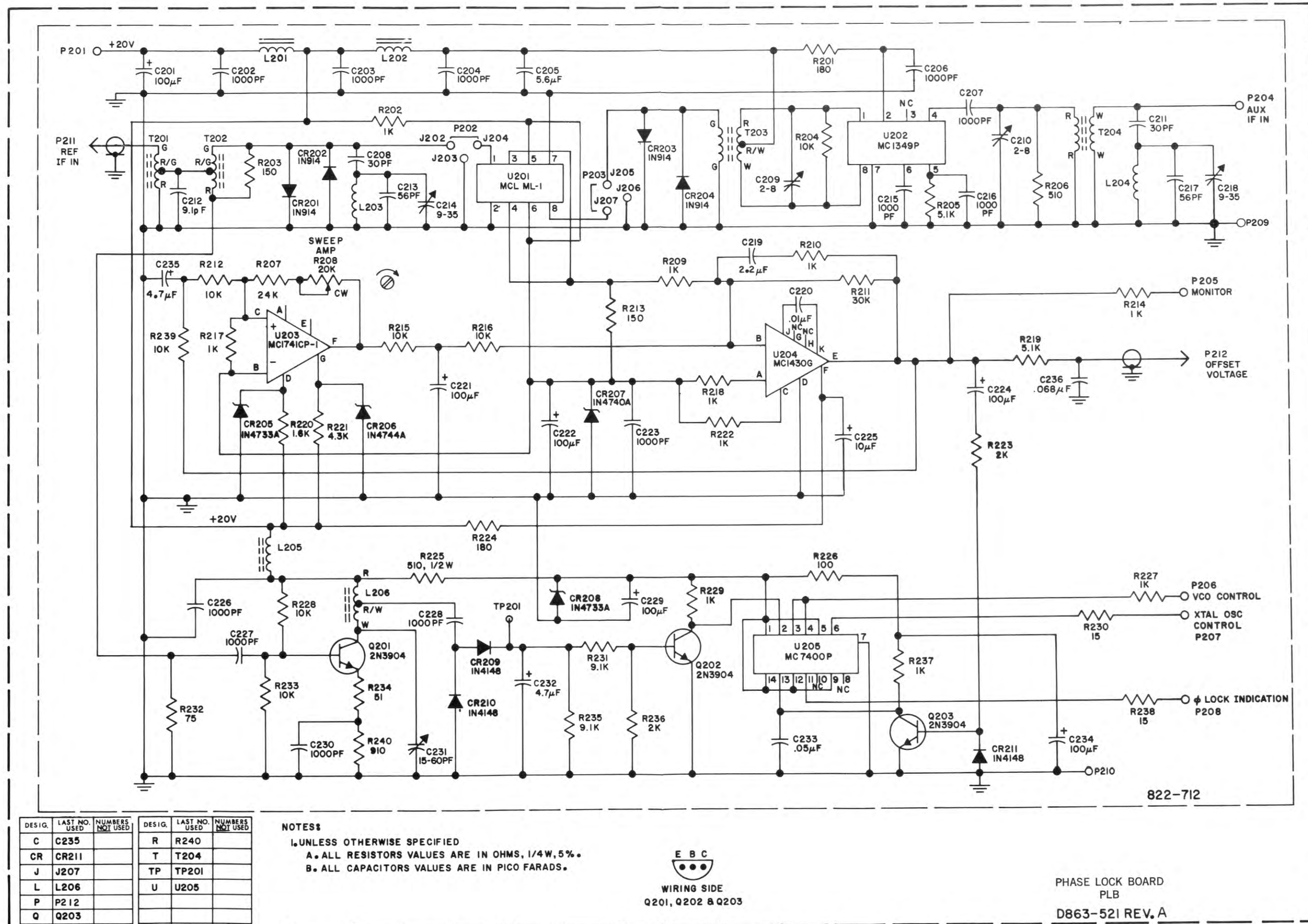
WIRING SIDE

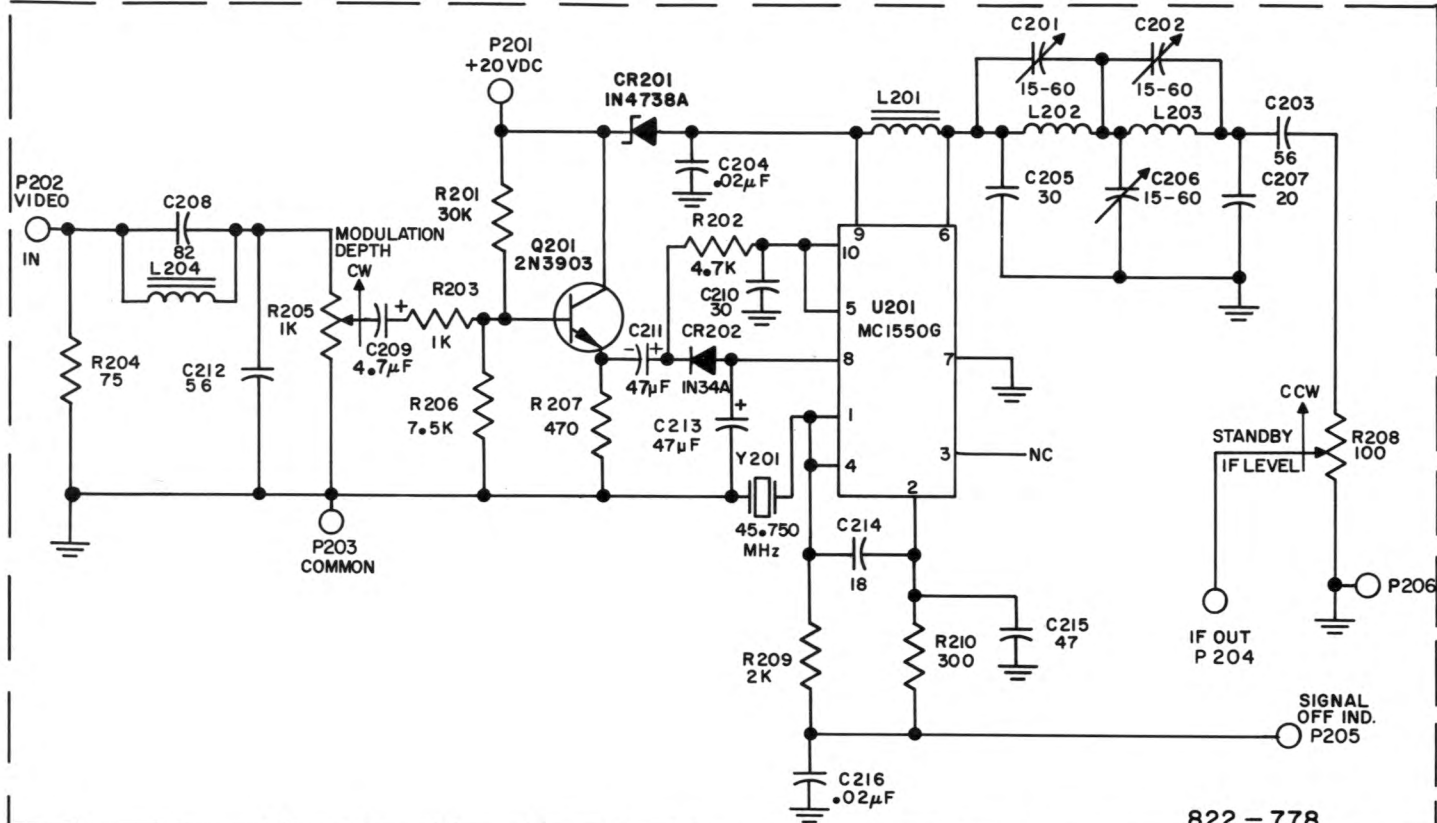


CAX
AUX IF BOARD
E863-517 REV. B

REPLACEMENT PARTS LIST

| MODEL PLB | | MODEL PLB | |
|------------------------------------------------------------------------|------------------|------------------------------------------------------------|------------------|
| ASSEMBLY No. 822-712 | | ASSEMBLY No. 822-712 | |
| DRAWING No. 863-521 | | DRAWING No. 863-521 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. | SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | | | |
| C201 | S127-153 | R201, R224 | 112-994 |
| C202, C203, C204, C206, C207, C215, C216, C223, C226, C227, C228, C230 | 124-077 | R202, R209, R210, R214, R217, R218, R222, R227, R229, R237 | 112-997 |
| C205 | 127-328 | R203, R213 | 112-973 |
| C208, C211 | 124-121-00 | R204, R212, R215, R216, R228, R233, R239 | 112-949 |
| C209, C210 | 128-546 | R205, R219 | 112-980 |
| C212 | 124-108-00 | R206 | 112-929 |
| C213, C217 | 124-138 | R207 | 112-963 |
| C214, C218 | 128-565 | R208 | S118-407-07 |
| C219 | 124-373 | R211 | 111-050 |
| C220 | 124-134 | R220 | 111-012 |
| C221, C222, C224, C229, C234 | 127-315-15 | R221 | 111-006 |
| C225 | 127-064 | R223, R236 | 112-930 |
| C231 | 128-224 | R225 | 112-326 |
| C232, C235 | 127-079 | R226 | 112-950 |
| C233 | 124-150 | R230, R238 | 112-973 |
| C236 | 124-394 | R231, R236 | 112-987 |
| DIODES | | | |
| CR201, CR202, CR203, CR204 | 139-169 | R232 | 112-954 |
| CR205, CR208 | 137-805 | R234 | 112-087 |
| CR206 | 137-761 | R240 | 112-920 |
| CR207 | 137-722 | TRANSFORMERS | |
| CR209, CR210, CR211 | 137-824 | T201 | C144-416-00 |
| INTEGRATED CIRCUITS | | | |
| U201 | 134-029-00 | T202 | C144-417-00 |
| U202 | 134-026-00 | T203 | B144-745 |
| U203 | 134-506 | T204 | B144-746 |
| U204 | 134-028-00 | TRANSISTORS | |
| U205 | 134-504 | Q201, Q202, Q203 | 130-226 |





NOTES:

- I- UNLESS OTHERWISE SPECIFIED:
- A- ALL RESISTORS ARE IN OHMS, 5%, 1/4W.
- B- ALL CAPACITORS ARE IN pF.

822-778

SCHEMATIC
CSR

CARRIER REPLACER/MOD

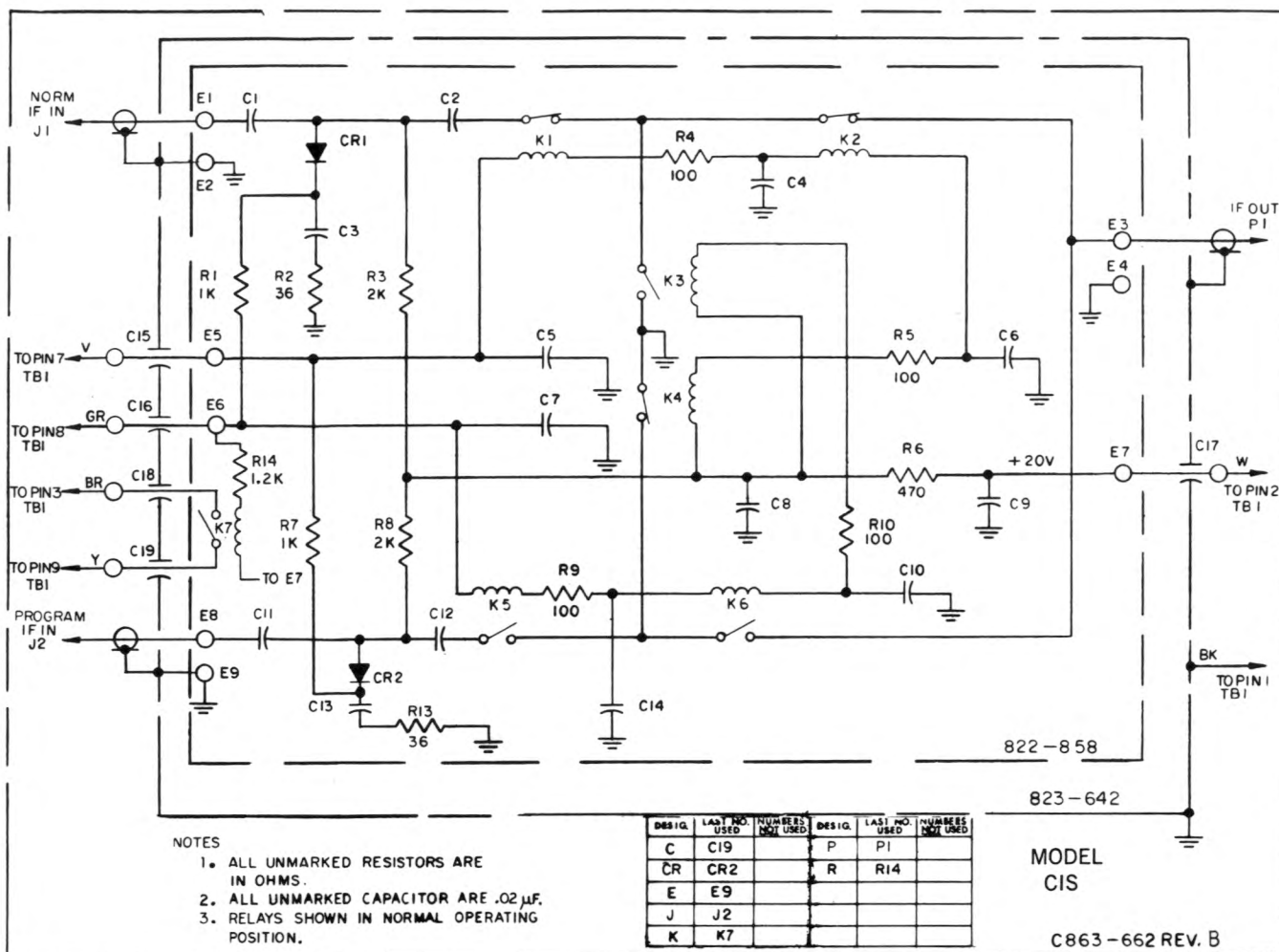


C863-590 REV. B

REPLACEMENT PARTS LIST

| CARRIER REPLACER/MOD. | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-778-00 | |
| DRAWING No. 863-590 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C201, C202, C206 | 128-224 |
| C203, C212 | 124-162 |
| C204, C216 | 124-078 |
| C205, C210 | 124-121-00 |
| C207 | 124-119-00 |
| C208 | 126-166 |
| C209 | 127-079 |
| C211, C213 | 127-330-00 |
| C214 | 124-079-00 |
| C215 | 124-122 |
| CRYSTAL | |
| Y201 | S139-279-45 |
| DIODES | |
| CR201 | 137-808 |
| CR202 | 139-261 |

| CARRIER REPLACER/MOD. | |
|------------------------------------------------|---------------------|
| ASSEMBLY No. 822-778-00 | |
| DRAWING No. 863-590 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| INTEGRATED CIRCUIT | |
| U201 | 130-223 |
| RESISTORS | |
| R201 | 111-050 |
| R202 | 111-001 |
| R203 | 112-977 |
| R204 | 112-954 |
| R205 | S118-401-01 |
| R206 | 112-986 |
| R207 | 111-662 |
| R208 | 118-231 |
| R209 | 112-930 |
| R210 | 112-096 |
| TRANSISTOR | |
| Q201 | B130-187 |



REPLACEMENT PARTS LIST

| MODEL CIS | |
|-------------------------------------------------------------|------------------|
| ASSEMBLY No. 822-858 | |
| DRAWING No. 863-662 | |
| SCHEMATIC DESIGNATIONS OR PART DESCRIPTIONS | JERROLD PART No. |
| CAPACITORS | |
| C1, C2, C3, C4, C5, C6, C7, C8, C9, C10, C11, C12, C13, C14 | 128-078 |
| C15, C16, C17, C18, C19 | 129-200 |
| DIODES | |
| CR1, CR2 | S137-832 |
| RELAYS | |
| K1, K2, K3, K4, K5, K6, K7 | 163-033 |
| RESISTORS | |
| R1, R7 | 112-977 |
| R2, R13 | 112-978 |
| R3, R8 | 112-930 |
| R4, R5, R9, R10 | 112-950 |
| R6 | 112-101 |
| R14 | 112-921 |